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LOSI TRIPLE-XNT
SPORT
DURATRAX
OVERDRIVE



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WITH ONE
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PAGE 224

PLUS

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XTM Racing
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ON THE COVER: (from top) Team Associated's Nitro TC3 blasts past, wearing a Protoform Dodge Stratus shell with paint by Bob Hastings; the Tamiya Terra Crusher cleans a hill; Kyosho's MegaForce levitates for the lens. All photos by Walter Sidas.

The best RTRs yet!

Ready-to-run have reached a new zenith. As far as quality and completeness goes, I just don't know how RTRs can get any better. Oh, I'm sure they will improve even more; every year, the manufacturers seem to top themselves. But I don't know how they'll do it; today's RTRs are just so good.

Let's look at the RTRs in this issue alone. First up: the **Tamiya Terra Crusher** and **Kyosho MegaForce**. After back-to-back testing both trucks, I couldn't be more impressed. I'll leave the individual performance details to the article, but I do want to mention two very basic facts that overshadow top speed, bump handling, acceleration and all the other "How good is it?" criteria we levy against test vehicles. What struck me about the Tamiya and Kyosho trucks was, one: both started as easily as my Civic, and two: both ran all day with nary a needle twist or flameout (and with a much more satisfying exhaust tone than my Civic's). I can remember when running nitro was a don't-forget-your-toolbox affair, but today's nitro RTRs are all about run time, not downtime.

I can remember
when running nitro
was a don't-forget-
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today's nitro RTRs are
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not downtime.

Now let's talk about high performance—something that used to be the exclusive domain of kit vehicles. Traxxas deserves credit for lighting the go-fast fire under manufacturers who had been following the go-slow status quo. Once Traxxas started spec'ing .15 engines in its RTRs (and especially when it promised 50mph for the Nitro 4-TEC—and made good on it), the old "good for beginners" RTR concept just wasn't good enough anymore. Which brings us to what might be the ultimate expression of no-skimp RTR performance: the **Team Losi Triple-XNT Sport**. With the Sport, you get everything that makes the Triple-XNT a great racing truck plus an excellent engine, and you don't have to build it. Or paint it. The only real reason for non-racer hobbyists to buy a kit Triple-XNT is because they prefer to build, not because the kit includes better stuff than the RTR. I think that's how it should be; depending on the hobbyist's preference, assembling a kit is either the best part of RC or just something to get through before the fun of driving begins. No matter which side of the RTR fence you land on, it's good to know there's nothing to lose or gain by choosing to build or not to build. There's a Shakespeare gag in there, but I'm not going for it!

IN THIS ISSUE

TRACK TESTS: the RTR theme continues with reviews of the XTM Racing Baja Bullet and DuraTrax Overdrive, but we haven't forgotten the kit stuff: we have full tests of the red-hot Associated Nitro TC3, plus Schumacher's latest sedan, the Mission Carbon.

PRODUCT PROBE: Novak's Millennium charger is a two-time Readers' Choice Awards favorite; this month, we review the new "Pro" version as well as Novak's easy-to-use Ionic charger.

HOW TO'S: make misaligned wheel wells, wavy rocker panels and warped wings a thing of the past with Bob Hastings' body-mounting how-to, and then give "How to Start your Engine on the First Pull" a look to learn how to ... well, you know.

Plus, lots more stuff! Until next month—

Peter Vieira
Executive Editor

DREAM JOB ALERT

We're looking for an enthusiastic, organized individual to join **Radio Control Car Action**. This in-house (Ridgefield, CT) position requires knowledge of the RC car hobby, writing and editing experience and the ability to coordinate schedules and meet deadlines.



CHRIS GOES HOLLYWOOD!

If you've seen Chris Chianelli in action on his cable-TV hobby show, you already know he's a natural in front of the camera. In fact, he digs it so much that he's going to pursue the TV gig full time (as well as some other endeavors in the hobby world). We wish our longtime friend all the best. We'll miss you, Chris.

Send cover letter and résumé to:
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EVADER UPDATE

I liked your "Budget Blasters" feature in April *RC Car Action*. What a great concept—budget fun for \$100 or less. Thanks for including the Evader ST, even though it's slightly over your cap. An FYI: the prebuilt Evader ST includes a Photon Speed 20-turn motor along with the ESC, and that makes it an even greater bargain! *Bill Madaio*
DuraTrax/Hobbico

Aw, man; how did I miss that? I thought the Evader was a great bargain just with the ESC!
—Pete

PULLING FOR THE PULLEYS

I'm 14 and have been into RC with my RC10T3 for about one year. Your magazine has helped me so much, and in return, I have helped get three people into RC. Two of them race with me at a very friendly local club called Finish Line Family RC Racing.

Every person I have come across in RC has been nice and helpful. People have helped me jump into this hobby and have also taught me how to be competitive on a budget. The least that I can do is to pass it on to others.

You guys at *RC Car Action* have also helped a lot. Your articles,

course, of the Tamiya Terra Crusher in the March 2002 issue. It's good, but it could have been great if they had put a .21 in it. I'm holding out for an 1/8-scale, Maxx-style monster truck with a big block .21 stock from the factory. I'm not really looking to spend \$400 for the kit and another \$400 for chassis, engine and drive-train enhancements. Come on, somebody build it; you know there's a demand for it! Traxxas? Kyosho? Tamiya, DuraTrax, OFNA, anyone?
Marc-Edouard Mondesir
San Diego, CA

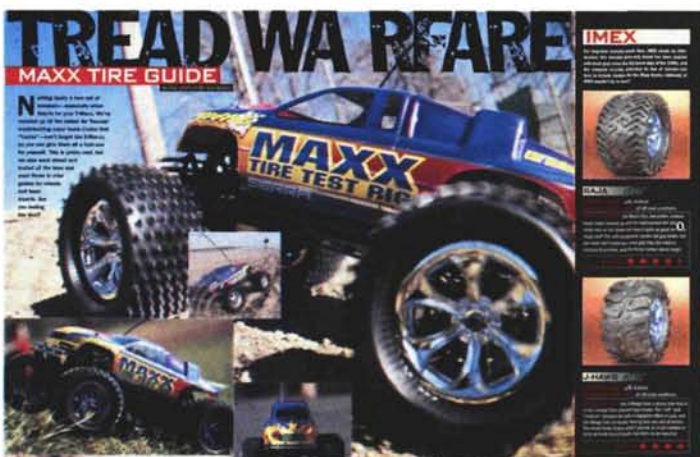
Check out the Monster X in "Inside Scoop" to see Kyosho's new .21 truck, but don't be surprised if you see other manufacturers going even bigger. Just look at the Thunder Tiger EK-4! But I'm with you; as good as the Maxx-style Monsters are with .15 to .18 power, we all want more.
—Pete

FACTORY WANNABE

I just got into RC cars last summer. I went to the track every Thursday to watch people race and to marshal. In midsummer I bought a Factory Team T3. I bought the best stuff I could afford; little did I know it was too much car for a beginner like me. The big race day came, and I won all my races over friends who have had RC cars for a while. How can I get the attention of sponsors? [email]
Nick Cowin

Well, I guess the T3 wasn't too much for you after all! If you want to get a sponsor, you'll have to get out to a national event and make the A-main against established factory

pro's. It's that simple—and that difficult.
—Pete



NOT A FACTOR

As I read the Maxx Tire Guide in the March 2002 issue of *RC Car Action*, I noticed that you used the tires on different rims. I'm sure you wanted us to see what the Maxx looked like with the different hoops, but maybe the weight difference affected the tires' performance. Just wanted to let you know.
Ben Groves
Sharpsburg, KY

We did change the wheels to give the test truck a different look, but comparable tires were tested on identical rims. For example, we tested slick- and road-tread tires on RPM Claws wheels and used Pro-Line Velocity rims for all the "race" tires. But even if we hadn't kept the rim choices consistent, I doubt performance would have been affected significantly; the rubber is far weightier than the wheels.

—Pete

product tests and tips have saved me a fortune! Also, a big thanks to my whole racing club—especially the Pulleys. Thanks to people like them, this is the best hobby in the world. [email]
Philip Haviland

BIGGER WOULD BE BETTER

Another competitor for the T-Maxx; great!—and not so great. I'm happy to see another truck built with the long travel suspension, 2-speed and reversing transmission and especially the purpose-built, high-ground-clearance chassis of the Maxx. I speak, of



"RC has made life easier out here"

I am a sailor on board the Navy's most powerful aircraft carrier, the *USS George Washington*. I just wanted to let you know that, with all that is going on with our military today after the 9-11 attacks, your magazine has helped a lot in dealing with being away from our families and keeping smiles on the faces of a lot of sailors who work with me. I brought your magazine out to sea along with my HPI Super Nitro RS4, and the guys love it. Already, four of my shipmates have joined me with nitro cars. During our last out-to-sea period, in some downtime from our usual 20-plus-hour days, we fired up several nitro-burning machines in our hangar bay. You should have seen how quickly a crowd gathered and started asking questions. Just to give you an idea, we have more than 5,000 people on board. Could you imagine if just one quarter of the crew bought an RC car? The new hobby has made life easier out here in our everyday routine. Thanks again. And let everyone in America know that we will always be here protecting what is rightfully ours—our freedom.

Tony Pavao, ABE1, USN
USS George Washington CVN-73



Tony, I've hooked up you and your buddies with *RC Car Action* T-shirts (you put your life on the line for all of us, and you get a T-shirt. Believe me, I'd like to do more!). Readers, to see the arsenal of freedom that Tony and his shipmates are launching off the decks of the *George*

Washington, check out "America's Air Power," on sale now.

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4806 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

EMAIL

- Peter Vieira: peter@airage.com
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- Kevin Hetmanski: kevinh@airage.com
- Steve Pond: stevep@airage.com
- Greg Vogel: gregv@airage.com

GERMANY

... home to Porsche, BMW, bratwurst, the world's most rabid David Hasselhoff fans (OK, the world's only David Hasselhoff fans), and, once a year, home to one heckuva hobby and toy show. The Nuremberg International Toy Fair is the hot spot for a sneak peek at the vehicles and gear we'll be drooling over this summer. We can't say when (or if) all the gear you see here will land in the U.S., but we know you'll enjoy seeing what we spotted.

KYOSHO



ALPHA II BUGGY >>

This 4WD off-roader is built on Kyosho's new shaft-drive Alpha II platform. You can't beat shaft drive for off-road action. If Kyosho follows its "Ready Set" formula, the Alpha II buggy will arrive factory-finished and will include a Perflex radio system and ESC, plus a battery and wall charger—a total RTR package. Kyosho distributed by Great Planes (800) 682-8948; www.kyosho.com.

"Monster X"

Until Kyosho comes up with a name for this .21-powered successor to its Nitro USA-1, we're just calling it "Monster X." This thing is packed with groundbreaking features; try a 3-speed transmission, chain drive and torsion link suspension on for size! The straight-axle X-truck is built for bear, and according to our 4x4 guy, Kevin Hetmanski, it's freaky-fast and puts that wheelie bar to good use—a lot. Look for a full exposé on the monster machine in the June issue of *Radio Control Nitro*.



Drone Engines

Team Orion is well known for spinning armatures and is now looking to do a little piston pounding with its new Drone engine line. Orion plans to offer made-in-Japan .15 and .18 side-exhaust Drones, and racers can pony up for rear- and side-exhaust versions of the Italian-made .12 Wasp Drone. Orion claims the Wasp will deliver more than 1hp and promises versions to suit ROAR, JMRCA and EFRA rules. Team Orion (714) 694-2812; www.team-orion.com.



Belted competition touring tires (Team Orion/HB Racing)



Orion's entering the tire game with the help of HB Racing and factory test-drivers Atsushi Hara (Hot Bodies/HPI) and Oscar Jansen (Team Orion). According to Team Orion, the new treads have an innovative sidewall design and lightweight belt reinforcement for improved acceleration and stability, are less sensitive to temperature variations and deliver maximum traction straight from the package—no cutting or grinding necessary. Team Orion (714) 694-2812; www.team-orion.com. HB Racing (562) 468-1121; www.hotbodies.com.

Tamiya F2001



Don't look for any F103 parts here; Tamiya's F2001 open-wheeler is all new, and it's a giant step up in complexity (and performance, no doubt) from the solid-axle, sprung-kingpin cars that preceded it.

Bellcrank-actuated inboard front and rear shocks and a molded monocoque chassis bring real-F1 tech to RC, and shaft-driven 4WD should make it easy to pitch the F2001 around turns the way Michael Schumacher does—especially with that gorgeous Ferrari bodywork.



M-26 "FULL OPERATION" PERSHING TANK

Acknowledging that the M4 just wasn't quite making the grade against the German Army's Tiger I's 88mm cannon, the U.S. developed the M26 Pershing heavy tank with its 90mm cannon for deployment during the final stages of WW II. That's what I learned from Tamiya, anyway; did you think I just knew that stuff? The Pershing is the latest piece of amazing armor in Tamiya's 1/16-scale line, and the "Full Operation" specs include a speaker unit, a new T-06 DMD electronic diff and Tamiya's MF-03 multifunction unit. The MF-03 gives the Pershing turret rotation, elevation control and cannon recoil, plus realistic sound effects that include weapon firing, engine revving and even tank-track clanking! If it were any more real, you'd have to enlist to get your hands on one.



TRF 414MII

The limited-production TRF 414M may have been the ultimate expression of Tamiya's high-performance touring-car vision, but the M-car was only available in small numbers for big money. The 414MII probably won't be what you'd call cheap, but it should be more in line with current pro-car price tags. The carbon-chassis car packs in lots of blue-anodized aluminum eye candy with its threaded shock bodies, bulkheads, motor mount and bellcranks. Other performance details abound: Delrin diffs with torque rings, carbon-fiber shock towers, swaybars and more. Just don't look for wheels and tires; Tamiya leaves the choice of rubber and rims up to you.

Tamiya America (800) 826-4922; www.tamiyausa.com.



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Balances:

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- 1/10th Truck

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Red Anodized

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*Reduce vibration in
your drivetrain for a
smoother running
better handling car!*



KO PROPO **EX-10 Helios**

KO's wild EX-10 looks like something out of Boba Fett's holster (or Jango's—I'm down with the Clone Wars, yo!), and it's as high-tech as its styling suggests. All of the features from the KO Mars will likely return, and the Helios adds 9-model memory (more, with an optional expander unit), a backlit LCD, scrolling data, two custom menus, direct servo control, earphone and user-selectable alarm melody. I'm not sure how many tunes it plays, but they're probably all equally distracting while you're on the drivers' stand.

KO Propo USA (310) 532-9355; www.kopropo.co.uk.



SCHUMACHER

FUSION .21 NITRO Sedan

Aw man ... think about the possibilities here. It's not hard to pull 50mph out of a 2-speed-equipped, .15-powered nitro touring car. How fast do you think a 1/10-scale touring car could go with a .21 and a 3-speed? The Schumacher guys aim to find out with the Fusion, which they hope will touch 85mph—if it can keep the tires on the wheels (not to mention the ground). A single belt spins the front and rear diffs, and the engine is fired by means of the hex drive that pokes out of the engine's backplate. Can't wait to drive this one!

Schumacher USA (813) 889-9691; www.racing-cars.com.



NITRO TERMINATOR

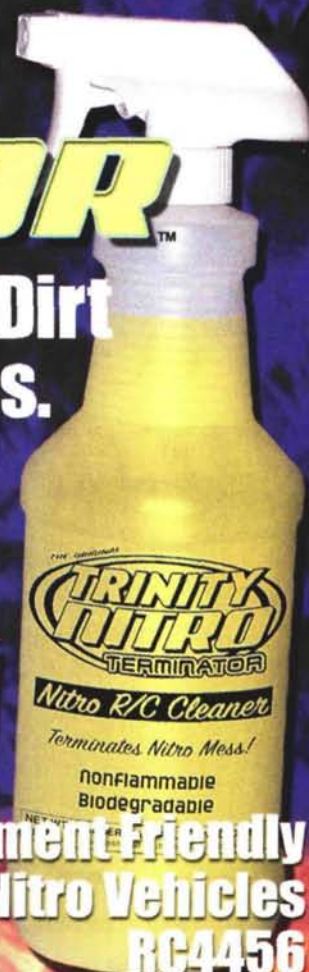
**Removes Nitro Racing Fuel, Oil, Dirt
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RC4456



NUOVA FAOR SF501 nitro motorcycle

Nuova Faor has adapted its stunning SF501 two-wheeler to nitro power! No word on whether the kit will include an engine (it looks as if there is a Picco shoehorned in there), and hopefully, the beautiful under-seat pipe will be part of the package; it's just too trick. And check it out: functional disc brakes on the wheels! Nuova Faor
www.nuovafaor.it.



STORM RALLY

GS Racing might be lending this "rally game" machine the Storm name, but if this is a Storm, it has been radically reconfigured; the only thing I recognize is the receiver box! An enclosed 3-belt drive train, billet shock towers, 2-speed transmission and a dual-rotor disc brake appear to be the basic features. Let's hope GS isn't set on those pink wheels!

GS Racing distributed by Horizon Hobby
(217) 355-9511;
www.horizonhobby.com.



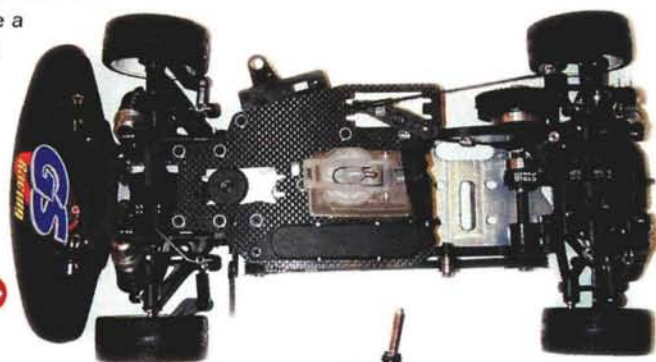
Vision Pro & RTR nitro sedans

Graphite upper deck, pivot-ball suspension, threaded shocks, 2-speed, swaybars ... the Vision Pro looks as if it's ready to take on any triple-belt competition nitro tourer. Too rich for your blood? Then take a look at the Vision RTR with its JR Python radio and included GS engine with tuned pipe.



Vision Pro

Vision Pro RTR



GOT HORSEPOWER?

THUNDER TIGER EK-4 UNLIMITED

As if the standard, .70-powered EK-4 doesn't have enough power, Thunder Tiger is preparing to introduce a new version called the EK-4 Unlimited, which will include the mega-motor you see here: Thunder Tiger's .90 BX (R). The soup-can-size heat-sink head is stock, and it looks as if a bunch of anodized goodies will beef up the truck to help it handle the horsepower. They say too much power is never enough ... trust me, this is enough!

TTR was also showing off this trick-looking Jaguar 2AP transmitter that has an LED battery gauge and adjustable throttle endpoints. Let's hope Thunder Tiger will include the 2AP with its RTRs.

Thunder Tiger/Ace Hobby Distributors (714) 642-2712; www.thundertiger.com.





Meanwhile, in the good ol' U.S. of A.

None of this stuff was spotted in Germany, but what am I supposed to do—not show it to you?



JAMMIN PRODUCTS Jammin nitro buggy tires

Jammin' Jay Halsey is one of RC's all-time great drivers and personalities, and he is currently campaigning the latest OFNA buggies along with the rest of the Jammin team. In addition to helping OFNA refine its 9.5 racing buggy, Jay has also dialed in a new line of Jammin tires. The Ripper and Shredder tires and their proprietary "Mega Traction" compound were tweaked over two years of on-track testing and competition, and the tires are molded in-house using a unique new method. According to Jay, the result is a super-true tire with precise sidewall and bead thickness.

"Zero Fade" foam is included, and you can get the rubber unmounted or factory-glued onto white dish wheels. The square-knob Rippers are good for hard-packed, blue-groove conditions with loose dirt, while the Shredders are best on the loose stuff. Jammin Products (909) 272-9447; www.jamminproducts.com.



REFERENCE BODIES

Team Trinity is now in the shell game! They've hooked up with Andy Jacobsen of Andy's Bodies fame and are set to release the Stratus "Y" 190mm touring-car shell shown here (as painted by Josh Cyrul; it's his car) and a new 1/12-scale Bentley EXP-9 with a super-slammed fit (seen here on Joel Johnson's ride). Trinity also plans to fill out the Reference line with a Reflex Nitro



Rocket 200mm shell plus bodies for 1/8-scale buggies, the Traxxas T-Maxx, Associated RC10GT and more. All 1/10 bodies will include detailed decal sheets and window masks, plus peel-off over-spray film.

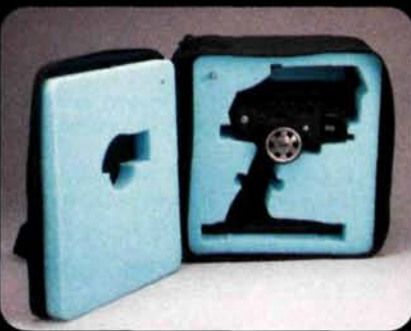


Brush Factory 2

Trinity's Brush Factory is the hot setup for breaking in and custom-cutting motor brushes, but it doesn't accept the new-design P-94 brushes. That's where the Brush Factory 2 comes in; it can serrate, cut and slot the P-94's brushes as well as all the standard-size standup and laydown brushes. The machined-aluminum tool is black-anodized and includes a steel brush serrator and brush slotting tools. Trinity Products (732) 635-1600; www.teamtrinity.com.

Monster transmitter bag

Very nice. Tough nylon fabric on the outside, cushy fitted foam on the inside, a wide carrying strap on top and a heavy-duty zipper keeps it all together. This



is first-class protection for your transmitter, and Trinity plans to offer the Monster bag in versions to fit all popular radios (that's an

Airtronics M8 in there, in case you have absolutely no idea what radios look like these days).



MICRO RS4

1/18 SCALE 4WD



NEW MICRO BODIES!

- #7606 Dodge Stratus Body (140mm W.B.)
- #7604 Porsche 911 Turbo Body (140mm W.B.)
- #7605 Corvette C5-R Body (150mm W.B.)

COMING SOON!

- #7607 VW Beetle Cup Racer Body (140mm W.B.)

OPTION PARTS



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Keep your motor running cooler

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#72456 Front Universals
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#72457 Spring Set

Springs for tuning your gear diff and suspension



#72480 - 72485 Steel Pinion Gears 8T - 13T

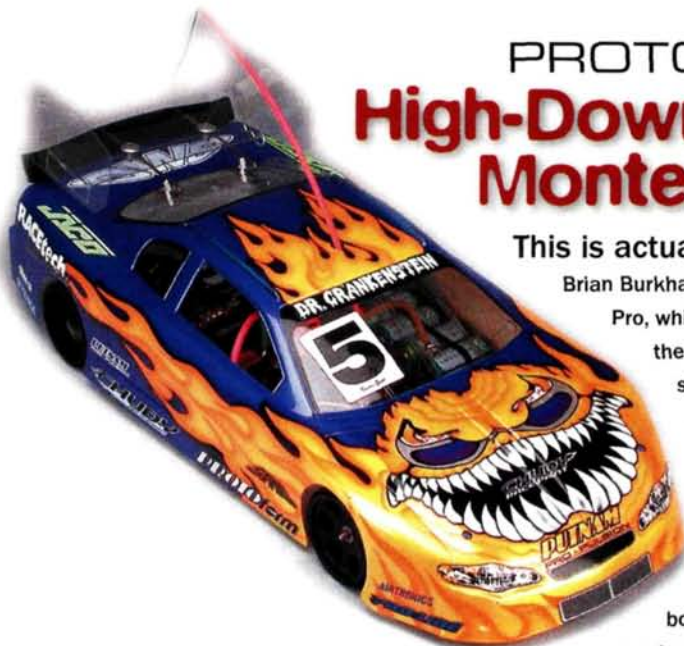
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HP RACING
Visit us on the web at... www.hpiracing.com

PROTOFORM High-Downforce Monte Carlo



This is actually a shot of Brian Burkhart's RaceTech Carpet Pro, which he equipped with the all-new Monte Carlo shell to take the wins in the 19-turn and 4-cell Pro Mod classes at the recent Snowbird Nats. If Brian's victories don't give the Monte body enough cred for you, try this on for size:

NASCAR driver Jeff Green, who pilots the America Online Monte Carlo, officially gives the Protoform Monte his thumbs up! Brian Chudy threw the primo paint job, and like all Protoform bodies, the new Monte Carlo includes an ample set of decals and window masks—and overspray film (I almost forgot!). All Protoform's (and Pro-Line's) bodies now have factory-applied film.

Protoform distributed by Pro-Line (909) 849-9781; www.prolineracing.com.

PEAK PERFORMANCE HELLFIRE RS24

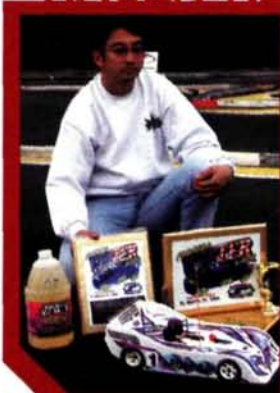
Peak's all-new ROAR/NORRCA-spec Hellfire RS24 rebuildable features installed surface-mount capacitors. It can be had in a standard version (for those of you who like to tweak your own motors), or you can go with the blueprinted race version and head straight for the track. The race motor includes a fully balanced armature, diamond-trued comm and performance-paired brushes and springs. Peak includes the dyno numbers so you can see how much power you're buying.

Peak Performance (714) 692-8533; www.peakmotors.com.



RACER NEWS BONUS

Kenji Osaka & Mugen take the Winter Nats!



Fresh off a win of the recent 1/8 on-road World Championship, Kenji Osaka and Mugen have struck again at the 1/8 on-road Florida Winter Nats. Osaka was driving a Mugen MRX-3 with a JP-Modified Novarossi engine, burning Mugen Racing Fuel. He also uses a Sanwa/Airtronics M8 radio and servos. ■

readers' rides

YOUR BEST BUILDS



LITO LOZADA, WESTLAND, MI TRAXXAS T-MAXX

Here's a good example of letting a truck's overall brawn speak for itself. The T-Maxx has been retrofitted with Clod Buster rims and tires, plus Trinity's stiffer black springs and a set of aluminum skidplates. A Pro-Line Suburban Hummer body completes this monster machine.



TAYLOR JACKSON, EAST WENATCHEE, WA TRAXXAS RUSTLER

You're at the track watching this saw-tooth machine eat up the competition. Then you look up on the drivers' stand to see which big burly freak is running it. Surprise! The pilot is actually 7-year-old Taylor Jackson, who races this 17x2-powered Rustler on Sundays. The monster paint job was created by J. W. Designs.



CURT HOEKEMA MANHATTAN, MT TEAM ASSOCIATED TC3

It's little wonder that Curt calls this Lotus his pride and joy. In only his first year of running touring cars, he managed to take a second-place finish among some very skilled competition. The TC3 is equipped with an HPI body, Orion Chrome stock motor, Futaba radio equipment and a Novak C2 ESC.

WILSON DAVILA, SANDY, UT DURATRAX NITRO QUAKE

After seeing his nephew's monster truck run, Wilson was bitten hard by the RC bug. He picked up this Nitro Quake, added a custom Dahms body, metal spur gear and digital Hitec servo. He tells us that his truck can blow off Monster Pirates, eats T-Maxxes for breakfast and even gave the new EK-4 a run for its money.



WIN A ONE-YEAR SUBSCRIPTION TO RADIO CONTROL CAR ACTION MAGAZINE!

Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Good luck!



**SCOTT EWING, HARRISBURG, PA
CUSTOM NITRO SPRINT CAR**

What happens when a couple of machinists get into the hobby? It isn't long before they start churning out some RC parts. This is Scott's custom-built nitro-powered sprint car—a joint venture with co-worker, Tim Curtis. The racer is equipped with a .15 engine and an Associated transmission, and it regularly appears on their local clay oval in Newville, PA.

**ELLIOT R. KLOSS, CEDARSBURG, WI
TEAM ASSOCIATED RC10 T3**

Elliot's last RC car was a Tamiya Frog from about 10 years ago. Thankfully, his wife updated his fleet with this new T3. The stadium truck is equipped with a Trinity 17-turn Speed Gems motor, Novak Rooster ESC and Pro-Line wheels and tires. The cool blue tribal flame job is accented by some trendsetting white window tint. And unlike the Lone Ranger, Elliot, it's OK to pull the mask off.



**CHRIS COOK
DALLAS, TX
HPI RACER 2**

This green machine is just waiting for the new touring-car season to begin. Chris thinks it should fare well given its list of hop-up accessories. The touring car has an O.S. .12 CV-R with Dynamite tuned pipe, 2-speed tranny, front and rear ball diffs, hard-anodized shocks and Futaba radio gear.

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#378	#383	#340
12 Dbl.	7 Dbl.	12 Trp.
#379	#390	#341
11 Dbl.	12 Sgl.	10 Trp.
#380	#391	#342
10 Dbl.	11 Sgl.	9 Trp.
	#392	#343
	10 Sgl.	8 Trp.

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BRIAN CAUDILL, BOZEMAN, MT TRAXXAS E-MAXX

What started out as a standard-issue E-Maxx has been turned into what you see here. The truck features an Atomik body, New Era full upper chassis, Hardcore Racing bumpers, chassis braces and skidplates, RPM A-arms and bulkhead braces, Traxxas Big Bore shocks and RC Raven progressive-rate springs. Brian mainly uses the truck for climbing and pulling.

READERS' RIDE OF THE MONTH

Just because you drive an RTR that came with a painted body doesn't mean that you have to settle for stock looks. What sets this monster apart is Brian's attention to the smallest details. Check out the engine emerging from the hood, the netting for the front and side windows and the yellow theme that's carried from the chassis to the wheels and springs. These small but significant additions take this Traxxas truck from dull to double-take.



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HINTS, TRICKS, TIPS AND IDEAS FROM READERS LIKE YOU

**GLITCH REDUCTION**

A good way to avoid glitches is to use shrink tubing on metal parts that contact other metal parts, such as throttle and steering linkages. It's an effective and good-looking way to reduce occurrences of this problem.

*JONATHAN YOST
Palmdale, CA*

MOISTURE SEAL

Water is the enemy of all electronics. You can protect these components by running a thin silicone bead across the seams.

*TEDDY WOODS
Tallassee, TN*

**MARSHAL GLOVES**

When turn-marshalling a race, use heat-resistant gloves so neither a hot exhaust nor a smokin' engine will burn you. This tip is not only for nitro racers but electric-powered cars as well; their batteries and motors can get quite hot.

*DOUG CALLAHAN
Jacksonville, FL*

**THEFT-PROOF RC**

Use a cable lock to keep your car safe at the track. Feed the cable through a hole in your chassis, and lock it to a solid object such as your pit table. You can lock up your transmitter, too; use the hole where the neck strap is attached to it. [email]

DAVE HOUGHTON

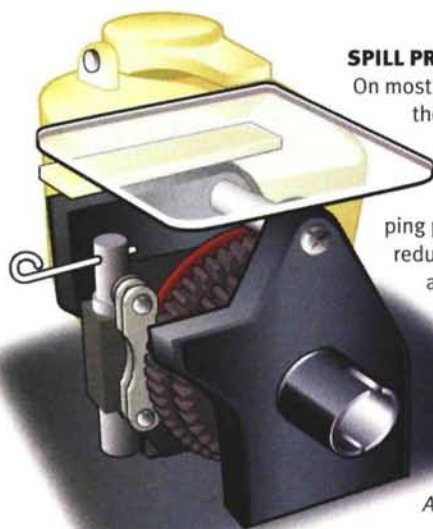
**IMPROVED RESULTS FROM SPRAY PAINT**

Before you use spray-paint cans to paint your vehicle's body, plunge the cans into warm water for about 30 seconds. Doing so will increase the can's internal pressure, thereby ensuring a uniformly fine mist. Be sure to shake the cans before and after you use them.

*B.B. JAMES
Brookfield, CT*



WIN AN OFNA YO-YO, OFNA OB4 AND RC CAR ACTION SUBSCRIPTION! SEE NEXT PAGE FOR DETAILS.

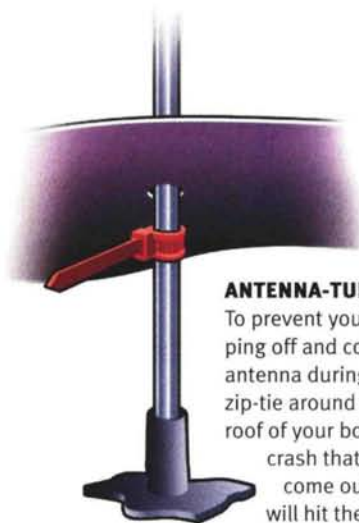


SPILL PROTECTOR

On most nitro-powered vehicles, the disc brake is next to the fuel tank. If fuel spills onto the brake when you refuel, your stopping power will be dramatically reduced. Avoid this by making a Lexan shield to cover the brake. (The shape and mounting points for the shield will vary for each model.)

MICHAEL STROHS

Alexandria, VA



ANTENNA-TUBE KEEPER

To prevent your antenna tube from slipping off and completely exposing your antenna during a bad crash, put a small zip-tie around the tube just below the roof of your body. Now if the car is in a crash that causes the antenna to come out of its mount, the tube will hit the inside of the body and won't be lost.

BRAD MENDENHALL

Stanwood, WA

EASIER BODY MARKING

Instead of using permanent-ink markers on polycarbonate whenever you create a paint scheme, try using dry-erase markers; their ink is easier to remove than that of permanent markers.

NICK EAST

Ann Arbor, MI

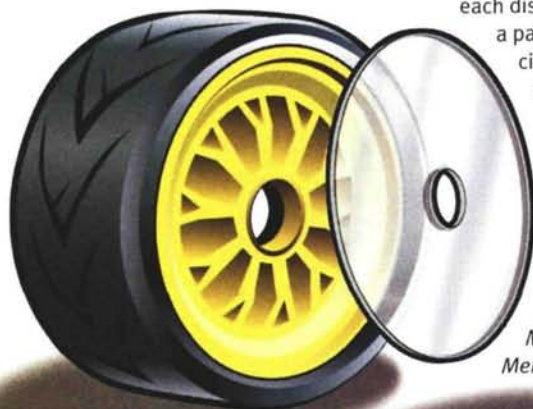


CUSTOM AERODYNAMIC WHEEL DISCS

To make aerodynamic wheel discs for your car, simply trace one of its wheels onto a sheet of Lexan (available in most hobby shops). Also be sure to mark the center of the wheel on each disc. Cut out each disc with a pair of body scissors or a circle cutter, and then cut a hole in the center of the disc for wheel-wrench clearance; you can use a body reamer or your circle cutter to do the job. Paint the discs, if you like; then CA them to your wheels.

MATT OLMSTED

Meridian, NY



LINT-FREE BODY PREP

Using a cloth or paper towel to dry your car's body before you paint it may leave it "lnty," and that can goof up your paint job. Here's a better way: after you've shaken off the excess water, blast the shell dry with a hairdryer. Don't use a heat gun; you could melt the Lexan.

PHIL STOLTZ

Summit, NJ



"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by Radio Control Car Action. Radio Control Car Action and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips."

WIN AN OFNA YO-YO AND RC CAR ACTION SUBSCRIPTION! Radio Control Car Action will give a 6-month subscription (or extend an existing subscription) and an OFNA Yo-Yo to the author of each idea used in "Pit Tips." The "Top Tip" winners will also be considered for "Tip of the Year" to be selected at the end of each year. The "Tip of the Year" winner will receive an OFNA OB4 International RTR electric car kit. Send a rough sketch to "Pit Tips," c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one nor return unused material.

troubleshooting

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**STRIPPED T-NUT**

Please help me! I just bought a new Nitro TC3, and the assembly was going perfectly well until I accidentally stripped the T-nut that holds the diff together. I must have overtightened the diff nut because the ears stripped off the molded T-nut. I

can't adjust the diff now, and it's set too tight. I also can't take the diff apart to fix it. I blew all my money on the kit and a new engine, and I can't afford to buy a complete diff assembly. Is there any way to get the T-nut out so I can replace it? [email]

Steve Bolin

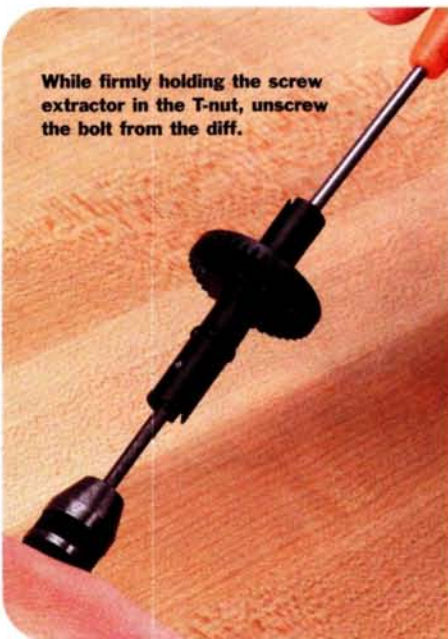


A screw extractor has a spiral reversed thread that's used to remove damaged hardware or hold it steady.

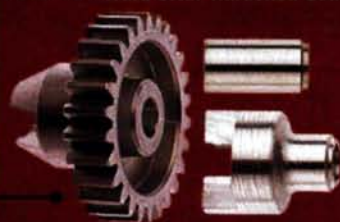
I did exactly the same thing when I was building one of the diffs in my Nitro TC3. I wasn't paying attention and gave the diff T-nut an extra turn that threaded it too far into the outdrive. This stripped the ears off the T-nut, and that meant the diff was impossible to adjust or take apart. To get you out of messes such as this, you need a screw extractor, which has a reversed spiral thread. Screw it counterclockwise into the broken T-nut until it has a good hold on it. While firmly holding the extractor, unscrew the bolt in the diff; it should come right out. Since the extractor has reverse threads, it will hold the T-nut still while you unscrew the bolt. If the T-nut spins when you start to insert the extractor, don't worry because you're turning the extractor in the direction you need the T-nut to turn, so it "unthreads" from the diff bolt.

Now you will be able to take apart your diff, but you'll have to replace the T-nut when you reassemble the diff.

While firmly holding the screw extractor in the T-nut, unscrew the bolt from the diff.

**REAL PERFORMANCE PRODUCTS!****Traxxas Lightened Spur And Double-Disc™ Slipper Kits**

RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor (small or large), 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx. Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

T-Maxx Forward ONLY Hardened Gear Kit

This kit contains a 26T hardened aluminum output gear, a forward drive hub adaptor and spacer. RRP 8585

Nitro and T/E-Maxx Accessory Spurs

A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

Traxxas Nitro Hardened Steel Clutchbells

CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

T-Maxx Hardened Forward Primary Gear

Machined from solid aluminum and hard coated. A direct replacement for the stock gear. RRP 8528

48P Absolute Series Pinions

Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available in 48P in 16T thru 28T sizes. RRP 1416 - RRP 1428.

48P / 64P SuperLite Aluminum Pinions

They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

48P Hard Nickel Plated Steel Pinions

These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

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IT'S THE IRON

I recently moved up to matched batteries from stick packs, but I just can't get my batteries to stay together. I can't get through a race day without one or more of the battery bars popping off and costing me a qualifier or a Main. I have Team Orion batteries and DuraTrax battery bars, and I soldered the pack together with 60/40 RadioShack solder. Please don't say it's the soldering iron; my brother gave me his old Ungar, and I know it's a good brand.

Brad Haley
Plano, TX



Here, you can see the grimy build-up on the ceramic heating element and the internal parts.

Your brother gave you an excellent soldering iron, but the soldering tip and internal heating element require regular cleaning and occasional replacement; I bet yours is ready for a tune-up. Remove the soldering tip by loosening the knurled knob that holds it (of course, the soldering iron must be cool and unplugged before you do anything). Next, remove the heating element sleeves, which slide over the ceramic heating element. Use a rag to wipe the heating element clean and then scrub the soldering tip and sleeves with an old toothbrush.

Reassemble the soldering iron and give it a quick test. Set the temperature-control knob to the highest setting and wait 10 minutes for the iron to reach maximum temperature. Next, apply solder to the tip of the iron. The solder should melt immediately and tin the tip of the iron. If it takes more than a second or two to melt, you'll need to replace the soldering tip and the heating element to bring your soldering iron back to a like-new condition. You should be able to find the replacement parts at your local hobby shop or electronics store.

Here are a few tips for building bulletproof battery packs.

- Use a battery building jig to hold the cells together while you solder the battery bars. Deans makes a jig that even holds the battery bar in place—kind of like having a third hand. Regardless of the brand, a battery jig will make building the pack a heck of a lot easier.
- Before you apply the solder, lightly sand the positive and negative terminals of each cell with fine-grit sandpaper. Sanding the surface



A battery jig such as this one from Deans works even better than having an extra hand. It tightly grips the battery cells and keeps the battery bars in place so your hands are free to hold the soldering iron and solder.

will remove any oil and grease from the battery terminals and provide a rough surface to which the solder will "stick" better.

- Use thin-gauge solder with a flux-filled core. This stuff melts fast and sticks great.
- Heat the surface of the battery terminal and battery bar with the tip of the iron before you apply the solder. Do not apply solder directly to the tip of the iron and then try to solder the battery bar to the battery terminal; doing so can damage the cells and cause a poor bond.

NEW T-Maxx Steel Diff Gear Set



T-Maxx / E-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel Phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP \$590

NEW T-Maxx Aluminum High Performance Brake Kit



New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. RRP \$560

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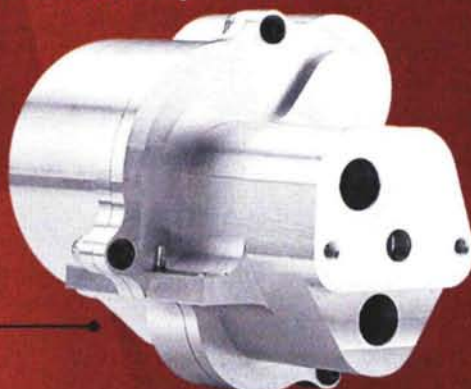


T-Maxx Vented Flywheels



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP \$551 Blue, RRP \$550 Natural Silver

Forward ONLY Racing Gearbox For T-Maxx



Precision CNC machined from aircraft grade billet aluminum this Forward ONLY Racing Gearbox will give your T-Maxx a serious competitive edge. RRP \$595

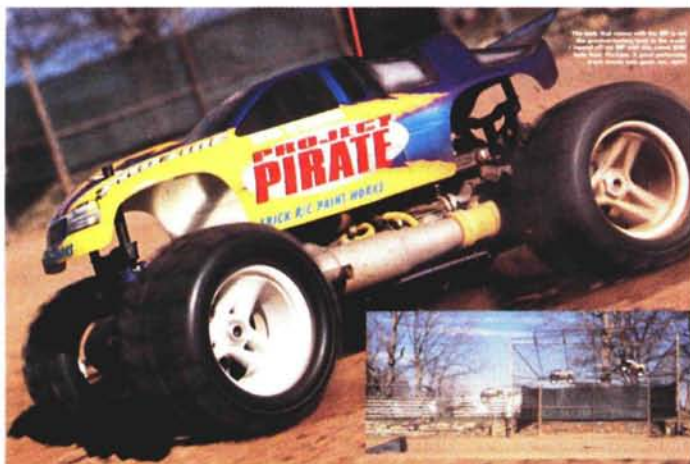
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TAMING THE MONSTER

I have an OFNA Monster Pirate. It runs great, but I wonder if I can do anything to make it handle more like a T-Maxx. My buddy just picked up a T-Maxx, and we race all the time. I like blowing him away in drag races, but off-road, my truck just doesn't handle as well as the Maxx. My friend told me to install softer springs, but I don't see how that would help. Can you pass along any setup advice that might make my truck handle better?

Timothy Cabela
Maywood, CA



Check out Kevin Hetmanski's "4x4" column in the March 2002 issue for added tips on tuning and modifying the Monster Pirate.



These new OFNA tires and rims are much lighter and smaller than the Monster's stock wheels and tires.

The Pirate's big tires provide the classic monster-truck stance, but they do little for the truck's handling. Check out Kevin Hetmanski's March 2002 "4x4" column for tips on how to make your truck a Maxx-killer. Pick up a set of OFNA MT3 Splits wheels and Monster Race tires. These tires are much smaller and lighter than the stock tire/wheel combo and will transform your Pirate into a race buggy in disguise. You might also want to ditch the front and rear sway-bars to allow the suspension to work without interference. Last, install Kyosho white springs ("soft" Inferno MP7.5 front springs) on the rear shocks, and your truck will be dialed. These mods will make a monumental difference to its off-road prowess.

RS4 Nitro Aluminum Brake Kit



Lightweight aluminum, variable braking system. RRP 1575

RS4 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling.
RRP 1570
RRP 1571 Pull Start

Stealth Sedan Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any HPI electric car or truck.
RRP 1860 thru
RRP 1896.

RS4 Nitro Small Aluminum Drive Pulleys



Hardened drive pulleys, sold in pairs.
RRP 1538

RS4 Top Shaft Pulley



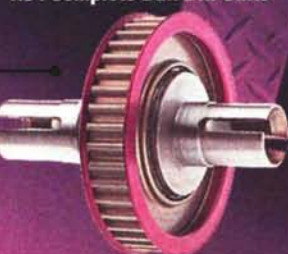
One piece pulley and shaft are precision cut and hard anodized. Purple anodized side flanges are pressed on. RRP 1527

RS4 / Pro / Pro2 / Nitro Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1585

RS4 Complete Ball Diff Units



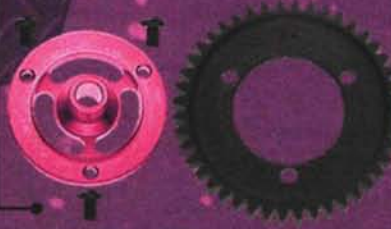
Hardened steel outdrives, ground and polished thrust washers, 2 5x8mm ball bearings, and aluminum pulley.
RRP 1590 Electric
RRP 1595 Nitro

RS4 Diff Pulleys



Precision machined, hard anodized aluminum diff pulleys.
RRP 1539 nitro sedans
RRP 1528 electric sedans

RS4 Nitro Lightened Gear Adapter



This lightened gear adapter includes a machined nylon spur that's tougher than the stock gear and will last longer.
RRP 1535

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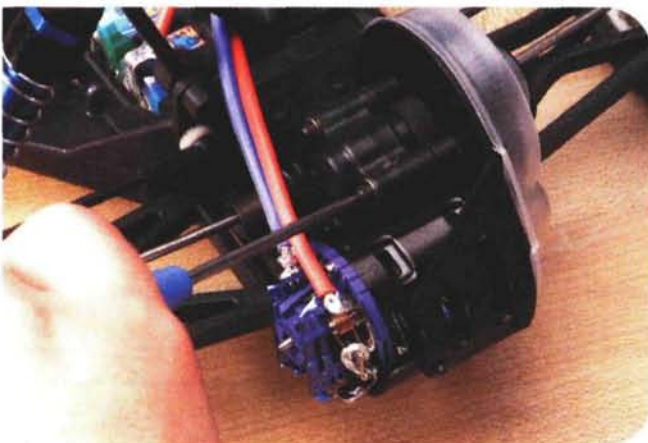
GEARBOX WON'T GO

I got a great deal on a new-in-the-box Kyosho Pro-X, and it has gone together well, except for the gearbox. I just can't get it to turn smoothly. The diff is fine, everything fits together easily, and there are no burrs on the gears or anything. I'm totally stumped. [email]

Marty Kaplow



Use thread-locking fluid to prevent hardware from vibrating out. Factory Team's fluid is a favorite.



If your gearbox doesn't turn freely no matter what you do, loosen the gearbox screws by 1/2 turn. Just be sure to thread-lock them.

The Pro-X gearbox was the last of the 6-gear-style transmissions, and I remember it well. First, be sure all bearings are fully seated, so the gears aren't getting squeezed when the gearbox goes together. If the instructions call

for any shims, try removing them. Finally, try thread-locking the gearbox screws so you can safely leave them 1/2 turn from fully tight; this should allow the gearbox to turn freely. If it still feels a little tight, try breaking in the gears using a drill press to spin them for an hour or so. Just chuck the top shaft in the drill, lightly clamp the gearbox so it doesn't spin (make sure the outdrives aren't clamped), and let it roll. ■

TOOLBOX

TRINITY MATT FRANCIS PINION CADDY

Trinity's cool-looking pinion-gear holders are machined out of solid hunks of aluminum that have been anodized red and laser-etched with Matt Francis RC logos.

These caddies hold up to 10 pinion gears. Simply slide the gear over the metal shaft, tighten the setscrew, and the gear stays put until you need it.

Part no. TMF1202; street price \$15.



NEED HELP?

Send your "Troubleshooting" questions and comments to George M. Gonzalez, georgeg@airage.com

RC10-GT Steel Combo



Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

www.robinsonracing.com

Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and hardened for super quiet precision and extra long life. Jammin' tranny grease is included. RRP 2213 RC10-GT, RRP 7505 Ultima GP-R

Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT RRP 7500 Ultima GP/EP-R

Blue Lightened Slipper Kit



The rear plate is hard anodized and the front plate is color treated. The front plate holds the pad forcing it to slip on the rear plate. When pad wears, just flip it over for a new surface. RRP 1515 Associated, RRP 7515 Kyosho Ultima

Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1475 TC3, RRP 1502 B3/T3

TC3 Ultra 48 Pitch Spurs



Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T, RRP 1670 RRP 1680.

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FIRST DRIVE >>



by George M. Gonzalez



Team Losi Triple-XNT SPORT



With the release of its new Triple-XNT Sport,

Unbelievable! RTR performance!

Team Losi hopes to set a new standard for nitro-powered RTR stadium trucks. The Sport offers the race-winning design and technology of the national champion Triple-XNT in a feature-packed, affordable RTR package. Although it's manufactured and assembled overseas, the Sport is 100-percent Triple-XNT, with 100-percent parts compatibility between kit trucks and RTR.

The Sport is loaded with hot racing features, including a complete set of ball bearings, a powerful and reliable .15 pull-start engine and a custom-painted body. You also get a completely adjustable suspension and a race-proven drive train inspired by the top-of-the-line Triple-XNT. And that isn't all: the Sport comes equipped with a full-feature JR Racing XR2 computer-radio system with a pair of Z270 servos installed on the chassis. Sounds great, but just how good is this new truck? Let's head to the track and find out.

FEATURES

CHASSIS. The Sport's 3/8-inch-thick aluminum chassis plate is configured identically to the Triple-XNT's chassis, except it's made of a different material and has a silver-anodized finish with a unique, sand-blasted surface. To prevent its screw heads from scraping on the track, all of the screw holes are countersunk on the chassis' bottom. The engine-mounting holes are slotted and recessed to provide fine gear-mesh adjustment.

The chassis is supported by a long, molded upper deck that spans from the front bulkhead to the end of the fuel tank. An aluminum brace attached between the upper deck and the transmission housing reinforces the area around the engine. The standard JR Z270 steering servo and ROAR-legal, 75cc fuel tank are installed in line and are caged by the upper deck. The receiver is taped to a platform on the right side of the upper deck and is protected by a molded box. Another JR Z270

servo installed on separate mounts handles the throttle and brake chores. The throttle servo mount also doubles as a switch-harness mount.

A molded battery box attached to the rear end of the chassis houses the included 4-cell battery holder. The battery box easily accommodates the 5-cell, rechargeable receiver packs that are commonly used in nitro racing, and it does a great job of protecting the cells from the elements.

TRANSMISSION. The Sport features a low-profile, 3-gear racing tranny with stepped idler gear and bottom-mounted ball differential. Like the rest of the Sport, the tranny's molded parts are identical to and interchangeable with those of the U.S.-made XNT kit truck. A dual-disc adjustable slipper clutch is also included. The Sport's tranny includes shielded ball bearings instead of the more expensive Teflon-sealed bearings found on the kit trucks.

SPECIFICATIONS

MODEL Triple-XNT Sport

MANUFACTURER Team Losi

DISTRIBUTED BY Horizon Hobby

SCALE 1/10

STREET PRICE \$339

DIMENSIONS

Wheelbase 11.25 in. (286mm)

Width 12.75 in. (324mm)

WEIGHT

Total, as tested 72.7 oz. (2,061g)

CHASSIS

Type 3.1mm plate with molded plastic upper deck

Material Aluminum (main chassis) and plastic upper deck

DRIVE TRAIN

Type Enclosed gearbox

Transmission ratio 4.11:1

Primary 18T clutch bell/51T spur gear

Drive shafts Universal joint

Differential Ball type

Slipper clutch Dual-disc

Brake Fiber disc with steel caliper

Bearing type Metal-shielded ball bearings

SUSPENSION

Type Lower H-arm with steel turn-buckle upper link

Shocks Hard-anodized, aluminum-body with bottom-loaded seal cartridge

WHEELS

Type One-piece dish, 2.2 in.

TIRES

Type (F/R) 4-rib/step-pin with square lugs, "medium" compound

ENGINE

Type .15 side exhaust

Carburetor 2-needle rotary

Starter Pull-start

Exhaust Team Losi header and tuned pipe



The Sport's 4.11:1 tranny makes it possible to use a much smaller spur gear for a given final drive ratio, with the benefits of a lower overall CG and superlative slipper clutch performance.

Additionally, the Sport's ball diff is equipped with hardened-steel diff balls instead of tungsten-carbide diff balls, and a diff spring replaces the stacked bevel washers found inside the Triple-XNT diff. This change was made for easier assembly and maintenance and doesn't seem to have affected the diff's performance.

Like the Triple-XNT's, the Sport's disc-brake mechanism is mounted on the same shaft as the idler gear. The fiber-composite rotor floats on a molded brake hub that's mounted on the idler shaft on the left side of the transmission case. The hub has a lobed shape to more evenly distribute loads on the brake rotor, and this should extend rotor life. A long steel brake lever actuates the aluminum brake calipers to put the pinch on the brake rotor.

SUSPENSION AND STEERING. The Sport's suspension parts are identical to those of the Triple-XNT kit's; the only difference is that the Sport's front and rear suspension arms, shock towers, caster and steering blocks and rear hub

At the Track

I took the Sport out to SVM Speedway in Sun Valley, CA, to carve some hot laps around the huge off-road track. This track has a dusty surface over a relatively hard base, and it becomes very slick between watering sessions. The long back straightaway and mild jumps and bumps make it easy to carry speed around the track. When the track surface becomes dry, however, traction becomes a problem.

Initially, it was difficult to drive the Sport on the slippery surface; the rear tires weren't ideally suited to the track (but for softer dirt, they should work well). With careful throttle control, however, I managed to get the truck around the track. After I had become accustomed to the track conditions (and the truck), I drove faster and faster. Before I knew it, I was power-sliding through the corners with total control. With the right approach, I was able to clear the triple jumps in one swoop.

I brought the truck back into the pits for refueling; I loosened the slipper a bit, filled the fuel tank and then headed back to the track. After the slipper-clutch adjustment, I was able to get the power down to the ground more effectively, and the truck was even easier to control.

The Sport is an excellent bump-handling machine. It held its composure and made me look like a good driver no matter how crossed up I got going through the obstacles, and with its abundance of low-speed steering, I was able to cut into and out of traffic and pass other vehicles on the inside of the corners—not bad for a truck that's equipped with a standard steering servo!

The Mach .15 engine ran well throughout testing. It fired easily when cold, and hot restarts weren't a problem. The engine is also well matched to the truck, and delivered snappy acceleration and impressive top-end (maximum speed: 37mph), with a nice, broad powerband that made it easy to control the horsepower at the wheels. Getting familiar with the Sport's top speed also put the truck's brakes in the spotlight. The thick fiber disc and steel caliper did their jobs well, and provided fine deceleration and stopping control.

What you get

—and what you'll need

The Sport comes with a complete Triple-XNT instruction manual as well as a "Getting Started" guide, engine break-in and tuning instructions and a "Troubleshooting" section. The only thing left for you to do after you open the box is to mount the antenna tube on the chassis and install transmitter and receiver batteries (not included). To get your Triple-XNT Sport running, you'll need the following:

- ➔ 8 AA alkaline batteries for the transmitter.
- ➔ A 5-cell rechargeable receiver pack (Trinity makes a great one that's custom-fit for the XNT), or 4 AA alkalines for the included receiver battery holder.
- ➔ A glow-starter to heat the engine's glow plug for starting.
- ➔ A fuel bottle for easy, no-spill fueling; if you try to pour fuel into the Sport's tank from a gallon jug, you'll drown your truck and waste a lot of fuel.



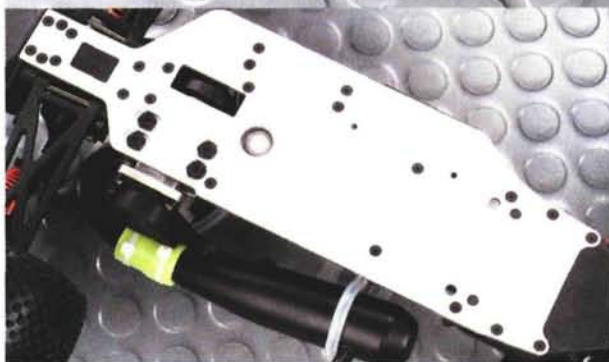
TEST EQUIPMENT

DYNAMITE BLUE THUNDER 20 PERCENT NITRO RACE FORMULA FUEL

I've always attained excellent results with Blue Thunder and my .12 race engines. The Team Losi OEM engine ran strongly and consistently tank after tank with the 20-percent-nitro fuel. The engine was plentifully lubricated, as evidenced by the residual oil in the tuned pipe after every run.

DYNAMITE LOCKING GLOW DRIVER

My old glow starter was getting tired, so I splurged on one of Dynamite's locking models. I got the version with an included Ni-Cd battery and built-in meter. If you've ever tried three different glow plugs in your engine before you realized that your glow starter just needed a charge, you already know how handy that meter is!



Although not officially "7075," Team Losi did spec the most comparable alloy available for the fully countersunk chassis. Note the concave washers in the engine-mounting slots; the Sport is full of small, welcome details like this.

WHAT ABOUT LOSI'S OTHER RTR?

The Triple-XNT "bench-built" RTR has the distinction of being the first Team Losi vehicle to be offered ready to run, but it's hardly a conventional RTR. The bench-built trucks are hand assembled from Triple-XNT kits by Team Losi's own star drivers: Adam Drake, Todd Hodge and Greg Hodapp, among others. The bench-built RTRs also include a JR XR-3 FM radio, ball-bearing Z-550 Premium Race servos and a Picco .12 race engine. It's a nice package, but the bonuses don't come cheap. The Sport chassis delivers nearly equal performance to that of the bench-built RTR's, and thanks to the Sport's larger displacement .15 engine, you'll be able to run with the Picco .12-powered bench-built truck guys.

Likes

- Looks, feels and drives like the flagship Triple-XNT.
- 100-percent compatible with the Triple-XNT kit truck; all the replacement parts and accessories can be bolted right on.
- The included JR XR2 radio system is a keeper.
- Excellent getting-started guide as well as complete assembly instructions.
- Attractive factory-trimmed body is painted, not printed, so windows are clear.

Dislikes

- Cost; you'll pay a little more for the Sport because of its premium radio. It's worth every penny, but more money is more money.

carriers are molded of a new material that's softer and more resilient than the Triple-XNT's rigid Stiffezel molded pieces. Since the Sport's parts are indistinguishable from those of the kit, the letters "RTR" have been discreetly molded into them. The new material is noticeably softer but isn't overly flexible. The new composite material is better suited to the rigors of less-than-smooth driving and backyard bashing, and it will take more abuse at the track.

Damping is handled by aluminum-body, hard-anodized shocks that are identical to Losi's Hard Body shocks. The shocks feature bottom-loading shock cartridges with internal seals and molded shock pistons. All four shocks are equipped with orange springs, which are a good spring rate for most track use.

INCLUDED ELECTRONICS

JR Racing XR2 AM computer radio

The Sport includes an excellent JR Racing XR2 AM computer radio—a high-end radio by RTR standards. The radio system has an LCD screen, a membrane-type keypad and all the features you would expect from a computer radio system, including steering and throttle dual rate, endpoint adjustment (EPA), exponential and 2-model memory. Most RTR vehicles include a 27MHz radio system with only six available frequency crystal choices to simplify the distribution process, but the Sport includes a 75MHz radio system. I give Team Losi high marks for including the XR2; it's a radio you'll want to hang onto.

JR Racing Z270 steering and throttle servos

The 270 model replaces JR's previous 250 "standard" servo. Its specs are identical (49 oz.-in. of torque; 0.19-second transit time), but the output shaft bushings are now spaced farther apart to better support the shaft.



INSIDE THE MACH .15

The Sport's Mach .15 powerplant displaces .15ci (no surprise there), and it's

equipped with a sturdy pull-starter. The cord felt very strong—almost like Kevlar, and definitely a step up from a soft nylon starter cord. The engine's piston and sleeve use ABC construction (aluminum piston and brass sleeve with chrome plating), which is preferred for longevity and consistency. The Mach .15's tall blue-anodized heat-sink head also contributes to engine life by keeping engine temps in check, and the twin-needle rotary carburetor lets you dial in the mill for crisp off-idle response.



Left: Losi didn't skimp on the exhaust system; the pipe and manifold are black-anodized aluminum with an etched logo for bonus style points.

Right: see the "RTR" molded into the steering arm? That's the only design difference between the Sport's parts and made-in-the-USA Triple-XNT kit parts. Hard-anodized shock bodies are standard, and check out those beefy turnbuckles.



The Sport's dual-bellcrank steering system incorporates an adjustable servo-saver and features Losi's "advanced geometry design" (AGD), which has the bellcranks mounted at the same angle as the steering blocks to improve the steering geometry and eliminate bump-steer. Steel turnbuckles are included to allow front and rear camber and front toe-in/out adjustment, but they aren't the same turnbuckles as the kit XNT's; they're actually better, with more robust flats that are wider, easier to turn and less likely to strip.

BODY, WHEELS AND TIRES. The Sport comes equipped with a beautiful custom-painted body. It has actually been painted—not screen-printed—so the windows are clear. Woo-hoo! The body arrives completely trimmed with the driver's-side window removed and cooling openings in the front windshield and bed section of the body. The Sport will be available in three color schemes: grape, graphite and aqua. All three body choices feature a white-to-yellow fade up front, while the designated color dominates the rear half of the body.

The Sport includes a complete set of bright yellow, one-piece dish wheels, tires and inserts. The ribbed front and step pin with square-lug rear tires are not official Team Losi rubber but are molded of a semi-soft material for longer wear. To get you running in a hurry, the tires arrive bonded to the wheels. The Sport also includes shielded ball bearings for the front wheels and rear axles to provide smooth, hassle-free running.

RATING THE TRIPLE-XNT SPORT

I'm impressed! The Sport truck handles excellently. That really isn't surprising when you consider that it's a clone of the national championship-winning Triple-XNT kit truck. Team Losi has put together an excellent RTR truck that is easy for beginners to get rolling yet has performance that even hardcore racers will appreciate. The Sport arrives professionally assembled, includes a powerful and reliable engine and a full-feature computer radio and covers it all with a factory-painted, clear-window body; all in all, one of the best RTR values in RC. ■

SOURCE GUIDE

DYNAMITE Distributed by Horizon Hobby.

TEAM LOSI Distributed by Horizon Hobby, www.teamlosi.com.

HORIZON HOBBY (217) 352-1913; www.horizonhobby.com.

JR RACING Distributed by Horizon Hobby.

Team Associated Nitro TC3



TEAM ASSOCIATED UNVEILED THE NITRO TC3 PROTOTYPE at the 2001 New Model and Hobby Show in Chicago. It had many of the same parts as the electric TC3, including most of its suspension and drive-train components. After the show, armed with assessments and suggestions from industry professionals and racing enthusiasts, Team Associated's engineering team went back to put the finishing touches on the eagerly anticipated nitro touring car.

A few months later, details on the preproduction Nitro TC3 debuted in the February 2001 issue of *Radio Control Nitro*—our sister publication. It boasted many innovative new features, including a completely adjustable pillow-ball suspension, heavy-duty ball diffs and a sophisticated disc-brake system. It was new from the ground up and shared very few parts with its electric sibling.

The adage, "All good things come to those who wait" is certainly relevant here because the production Nitro TC3 appears to have the necessary ingredients to take on the competition. How does it handle? Is it easy to tune and maintain? How durable is it? Let's find out.

PHOTOS BY WALTER SIDAS



***HERE AT LAST—
AND IT'S FAST***



The Nitro TC3's suspension is completely adjustable. Caster, camber, toe, chassis droop and overall width can all be adjusted without having to buy extra parts or setup tools.

Below left: you'll have to look closely to see the gap between the 2-speed's clutch shoes and the second gear housing; tolerances are tight! Below right: the Team Kit is available in rear-exhaust and side-exhaust versions; the appropriate manifold and tuned pipe are included.



DATA CENTER

VEHICLE TYPE 1/10-scale nitro touring car

BEST BUYER Racers of all levels

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Excellent
Parts fit and finish Excellent
Durability Excellent
Overall performance Excellent

SPECIFICATIONS

MANUFACTURER Associated
Electrics
MODEL Nitro TC3 Team Kit
SCALE 1/10
STREET PRICE \$269.99

DIMENSIONS
Wheelbase 10.37 in. (263.39mm)
Width 7.75 in. (196.85mm)—adjustable

WEIGHT
Total, as tested 64.25 oz. (1,821g)

CHASSIS
Type Double-deck
Material Aluminum/plastic

DRIVE TRAIN
Type Shaft-drive 4WD
Primary 22T/26T clutch bell/50T/54T spur (2-speed)
Primary drive ratio 2.5:1
Final drive ratios (1st/2nd) 6.41:1/4.81:1
Drive axles MIP aluminum CVDs
Differentials Ball
Bearing type Rubber-sealed

SUSPENSION
Type Upper and lower suspension arms
Damping Threaded-body oil-filled shocks with volume compensation

WHEELS
Type One-piece plastic Pro-Line Gumby wheels

TIRES
Type Pro-Line V-Rage with foam inserts

Below: turnbuckle T-links allow rear toe-in adjustment. Heavy-duty RPM ball cups, large-diameter tie rods and 9/32-inch ball joints are used for maximum strength.



Rubber-sealed bearings and MIP CVDs equip both ends of the Nitro TC3. Note that the pivot-ball retainers are integrated into bolt-on caps, instead of using more common thread-in aluminum retainers with plastic ball pads.



THE NITRO TC3'S DISC-BRAKE SYSTEM IS A MILESTONE IN RC ENGINEERING.

KIT FEATURES

CHASSIS. The blue-anodized-aluminum chassis is extremely rigid, thanks to its 2.6mm lower plate, molded front and rear braces, radius sides and low-profile radio tray. All of the screw holes are countersunk; the engine-mounting-screw holes are slotted (to allow the engine's position to be varied) and recessed.

The radio tray features a sealed receiver box and a universal onboard battery mount that accommodates just about any receiver battery configuration. The steering and throttle servos, switch harness and antenna are all attached to the radio tray. Remove six screws, disconnect the steering and throttle links, and the radio tray is in your hand for cleaning and maintenance.

The optional wide ROAR-legal bumper has a urethane body protector and an optional, extra-wide, non-ROAR-legal Kydex lower bumper that's mounted on rubber grommets for the ultimate suspension and chassis protection. The bumper takes the brunt of the punishment during crashes. There's no doubt that this wide bumper will save you big bucks on replacement parts.

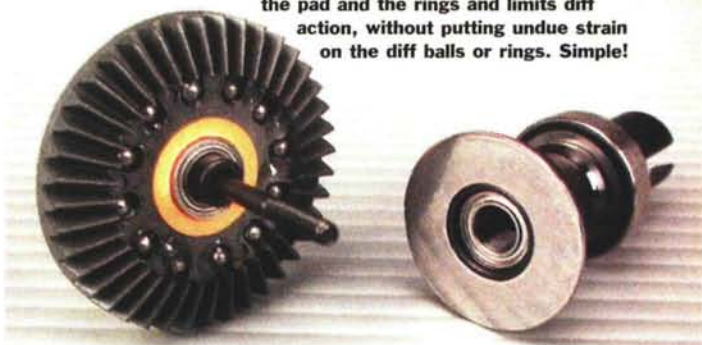
SUSPENSION AND STEERING. The Nitro TC3 features a highly adjustable pillow-ball suspension with upper and lower suspension arms at all corners. The front and rear pillow-ball carriers are interchangeable, and for extra strength, the pillow balls are machined out of high-carbon chromoly and are finely threaded to allow precise camber and track-width adjustment.

Up front, small clip-on spacers installed on the upper hinge pins allow the upper suspension arms to be moved forward or rearward to adjust caster. The caster options are 6, 9 and 12 degrees, depending on how you install the spacers. The shock towers are molded of the same rigid material as the suspension arms and offer several upper shock-mounting positions and two inner suspension-arm mounts to allow you to adjust roll center. Setscrews threaded into the lower suspension arms allow chassis-droop adjustment, and rear toe links allow infinite rear-toe-in adjustment. For extra security, the links are outfitted with large-diameter RPM ball cups, thick tie rods and $\frac{6}{32}$ -inch ball joints. The kit includes several suspension-alignment tools that allow quick and accurate front- and rear-track width, camber, ride height, chassis droop and front and rear toe adjustments.

The TC3's VCS Macro shocks have threaded bodies, so spring-preload is easy to adjust, and an internal foam-wrapped bobbin allows for volume compensation. The front shocks have stiff, copper-colored springs rated at 25 pounds while the rear shocks have 19.5-pound gold-colored springs. The kit's 40WT silicone shock fluid is right on the money for the stock shock piston and spring combination.

The unique steering system uses reverse-mounted twin bellcranks that

The orange insert in the diff gear is made of a slipper-pad-like material. When the diff is assembled, the extra-wide diff rings contact the pad. Tightening the diff increases the friction between the pad and the rings and limits diff action, without putting undue strain on the diff balls or rings. Simple!



are less susceptible to being damaged by dust, road grime and spilt fuel. The system provides accurate steering Ackerman and has a built-in, adjustable servo-saver, and the bellcranks pivot on ball bearings.

DRIVE TRAIN. The Nitro TC3 has the smoothest and most free-rolling 4WD system that I have ever tested. The front and rear gearboxes are joined by a solid aluminum drive shaft via lightweight molded drive cups attached to the front and rear input shafts. The ball diffs have internal friction discs pressed into the ring gears to provide a greater range of adjustability while also allowing the completed diffs to slip slightly without risk of damaging diff components from the heat of friction.

The Nitro TC3's disc-brake system is a milestone in RC engineering. The steel calipers feature laminated brake linings, and the rotor is made of heat-treated carbon steel that's ground to within $\frac{1}{10,000}$ inch to ensure smooth, fade-free braking. The brake rotor floats on four hardened dowel pins that are pressed into the rear drive cup to increase durability, and the brake cam pivots on bronze bushings.

The Nitro TC3 includes a clutch-type, 2-shoe, externally adjustable 2-speed tranny. The spur gears are tough, 32-pitch units from Kimbrough. Power is transferred to the wheels via MIP CVD axles (blue-anodized, of course) and the entire drive train—including the wheels—spins on rubber-sealed bearings.

ENGINE ACCESSORIES. There are two Team Kits: pull-start, side exhaust and non-pull-start, rear exhaust. Both include the necessary accessories to install an SG (pilot shaft) or a short crankshaft engine (not included): a lightweight flywheel; engine mounts; clutch nut; threaded 2-speed clutch

BUILDING & SETUP TIPS

I followed the excellent instruction manual closely. Although you might be able to build the car by relying exclusively on the 3D computer drawings, the descriptions in each step contain information that's important if you're to build the vehicle properly, so don't skip on the reading. The Nitro TC3 is not difficult to assemble, but it will take longer to build than an electric TC3. These tips will help.

GREASE THE SCREW THREADS. While threading some of the fasteners into the rigid molded components, my hands actually developed a few blisters. Put Associated black grease on the screw threads before you tighten them. The screws that secure the front and rear chassis braces to the transmission cases (bag D, steps 1 and 2) and the radio tray to the chassis braces (bag H, step 8) were particularly difficult to tighten.

THREAD-LOCK. The kit includes a little MIP thread-locking compound. After you've used it to build the CVDs, save what's left to coat the engine-mounting screws, the clutch nut, the setscrews in the linkage stops, the button-head screw that secures the clutch bell and any other screws that are to be threaded into metal.

BAG C, STEP 2. Thread the diff bolt (no. 6573) all the way through the T-nut (2330) before you install the T-nut and diff spring inside the long diff outdrive. Pre-threading the diff bolt through the locknut that's pressed inside the T-nut will make tightening the diffs easier (bag C, step 4).

BAG C, STEP 4. Follow the ball-diff adjustment instructions to the letter. The friction disc in the middle of each ring gear allows the completed diff to slip slightly. Unlike on more conventional ball diffs, you will not be able to tighten the diffs to the point at which the ring gear is impossible to move. With this in mind, do not overtighten the diff bolt, or you may damage the diff nut (2330). If the completed vehicle torque-steers (veers to the right) when you peg the throttle, the diffs are too tight. Loosen them slightly and try again. Ideally, as indicated in the assembly instructions, the front diff should be set a little tighter than the rear diff.

YOU'LL NEED

- Transmitter and receiver
- Throttle and steering servos
- Onboard battery pack
- .12 or .15 engine
- Fuel
- Glow igniter
- Tire glue
- 200mm touring body
- Paint
- Starter box (for non-pull-start engines)

FACTORY OPTIONS

- Blade-type front roll-bar kit—part no. 1715
- Lightweight 2-speed clutch housing—1701
- Lightweight 2-speed one-way hub—1700
- Factory blue Nitro TC3 turnbuckle set—1713
- Complete carbon-fiber kit—2371
- Spring set (9 pair)—3988

bell; easy-to-install clutch shoes with stiff springs; the appropriate exhaust manifold and tuned pipe; fuel line; and the necessary throttle and brake-linkage hardware for both rotary and slide-carb engines. A 75cc, filtered and baffled fuel tank with a tightly fitting, quick-fill fuel cap completes the package.

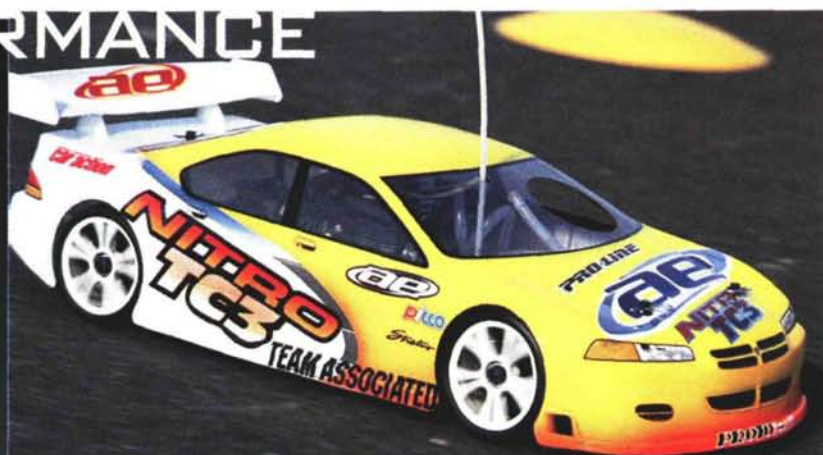
BODY, WHEELS AND TIRES. The Team Kits do not include a body, but just about any 200mm touring-car shell will fit. I outfitted the car for photos with a Protoform

Dodge Stratus painted by "Body Shop" author Bob Hastings. The kit also includes a complete set of Pro-Line V-Rage tires and inserts and white Gumby wheels.

PERFORMANCE

I headed out to Sun Valley Micro Speedway (Sun Valley, CA) to test the Nitro TC3. This track is designed for larger vehicles— $\frac{1}{8}$ and $\frac{1}{5}$ scale—and it's as big as a football field.

The Nitro TC3 accelerated like a rocket and launched as straight as an arrow whenever I pegged the throttle. I am impressed with the Nitro TC3's handling. The car has an abundance of steering, but the rear end stays planted—even when I tossed the car into the corners like a rookie. This driving style did nothing for my lap times, but it was fun reeling the car back in from the outside of the corners.



THE NITRO TC3 HAS THE SMOOTHEST AND MOST FREE-ROLLING 4WD SYSTEM THAT I HAVE EVER TESTED.

LIKES

- Excellent disc-brake system.
- Smooth, reliable 2-speed tranny.
- Fully adjustable suspension.
- Manifold and tuned pipe are included.
- Setup tools are included.

The 2-speed tranny works very smoothly. Once I had found the perfect shift point for the track, I never had to adjust the tranny again—no shift-point drifting. The disc-brake system provides particularly good linear braking without a hint of fade. I sent the Nitro TC3 deep into the corners, and a slight tap on the brakes slowed it down enough to provide the necessary turn-in. It held a tight line going through and exiting the corners.

I made the mistake of attempting a high-speed pass on the massive, outside, banked straightaway. The car was so far away from the drivers' stand that I could hardly see or hear it. As a result, I totally misjudged the sweeper at the end of the straightaway and launched the Nitro TC3 off the lip of the banked corner. It caught some giant air and sailed nearly 30 feet into the adjacent off-road track, where it landed on one of the berms. I expected the worst, and I found it on its lid, but the engine was still running. I inspected it thoroughly; the only damage was to the receiver: the antenna tube had been ripped off and had taken the lead with it. The car survived, though, so I don't doubt that it's tough!

THE VERDICT

I am very impressed by the Nitro TC3. It's fast because of its friction-free drive train; it handles predictably, lap after lap; and it has the best braking system I have ever tested. The suspension is completely adjustable and easy to tune, thanks to the included setup tools. The Nitro TC3 is also very easy to work on. In my opinion, Team Associated has raised the bar in the nitro touring car segment by designing a pro-level vehicle that's truly user-friendly. ■

DISLIKES

- The chassis-mounted carrying handle isn't tall enough to protect the engine's heat-sink head in a rollover.

SOURCE GUIDE

AIRTRONICS (714) 978-1895; www.airtronics.net.

ASSOCIATED ELECTRICS (714) 850-9342; www.rc10.com.

DURATRAX; distributed by Great Planes Model Distributors (800) 682-8948; www.duratrax.com

KO PROPO USA (310) 532-9355; www.kopropo.co.uk.

NOVAK ELECTRONICS (949) 833-8873; www.teamnovak.com.

OFNA (949) 586-2910; www.ofna.com.

PICCO; distributed by Trinity Products, Inc.

PRO-LINE (909) 849-9781; www.pro-lineracing.com.

TRINITY PRODUCTS, INC. (732) 635-1600; www.teamtrinity.com.

Novak XXTRA

75MHZ FM receiver

This has every receiver frequency synthesized into memory, so RX crystals are a thing of the past. The XXTRA receiver is universal and works with Airtronics, Futaba, Hitec, JR, KO and Multiplex radio systems. The receiver worked without a hiccup, and I enjoyed being able to change frequencies without having to dig around in my tool-box for the corresponding crystal.



Additional items used

Airtronics

M8 transmitter

Picco .12 RC Speed side-exhaust engine (non-pull-start)

KO 2143FET and 2144FET digital steering and throttle servos

Trinity Nitro Metal Hydride 1100mAh receiver pack

Trinity 30% Monster Horsepower Fuel

OFNA True-Start universal starter box

DuraTrax C-cell glow-plug igniter

THE COMPETITION

VEHICLE	SHOCKS	CHASSIS	AXLES	UPPER DECK	TIRES	STREET PRICE*	REVIEWED
Kyosho V-One-R	Threaded aluminum	7075 3mm	Universal	Plastic	Rubber slicks	\$299	09/01 RC Nitro
Mugen MTX2 Sports	Threaded aluminum	7075 3mm	Universal	Plastic	Rubber slicks	\$369	08/01
Serpent Impulse	Threaded plastic	7075 3mm	Universal	Plastic	Rubber slicks	\$279	08/00
Team Associated Nitro TC3	Threaded aluminum	7075 2.6mm	MIP CVD	Plastic	Pro-Line V-Rage	\$269	05/02
Trinity Reflex NT	Threaded aluminum	7075 4mm	Universal	Carbon fiber	TRC foam	\$399	02/02
Yokomo GT-4W	Plastic	7075 3mm	Universal	Plastic	Rubber slicks	\$319	12/00

*Prices vary.

DuraTrax Overdrive ST



DURATRAX'S BIG NEW TRUCK, THE THUNDER QUAKE, HAS ATTRACTED A LOT OF ATTENTION LATELY, but DuraTrax hasn't forgotten the $\frac{1}{10}$ -scale machines that got the brand rolling in the ready-to-run (RTR) market—namely, the still-popular Maximum ST and MT. The latest DuraTrax machine—the Overdrive ST RTR—combines the best of the company's RTR features (for example, included transmitter batteries, a fuel bottle, a glow starter, glued tires and a finished body) and the hot-button performance features of the Thunder Quake (4WD, 2-speed, reverse) in a new $\frac{1}{10}$ -scale, stadium-truck package that is unique and appears highly dirt-capable.

PHOTOS BY WALTER SIDAS

Stadium-truck looks
& **monster-truck**
features





The suspension components are built for durability. Check out the stout Rapid-Tune turnbuckles and aluminum steering knuckle. The upper camber link with its "tuning fork" end is unlike any I have seen, but it does provide extra support for the C-carrier.

Below left: clearly visible is the throttle-return spring—a great safety feature that prevents runaways if your radio system fails. Below right: here, you can see the slots in the chassis plate that allow access to the flywheel and the steering servo. The slots also help center the front, center and rear bulkheads.



DATA CENTER

VEHICLE TYPE 1/10-scale, 4WD, .17-powered RTR stadium truck

BEST BUYER All nitro-power enthusiasts

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions Very good
Parts fit/finish Very good
Durability Very good
Overall performance Very good

SPECIFICATIONS

MANUFACTURER DuraTrax
MODEL Overdrive ST
DISTRIBUTED BY Great Planes Model Distributors
SCALE 1/10
STREET PRICE \$360*

DIMENSIONS
Wheelbase 11.38 in. (289mm)
Width 12.2 in. (310mm)

WEIGHT
Total, as tested 84.16 oz. (2,386g)

CHASSIS
Type Double deck
Material 2mm 6061 T6 aluminum

DRIVE TRAIN
Type Shaft-drive 4WD
Transmission 2-speed; two forward and two reverse
Primary Clutch bell/spur gear
Drive shafts (F/R) Universals/dogbones
Differentials Bevel gear
Bearing type Metal-shielded ball bearings

SUSPENSION
Type Lower H-arm with turnbuckle camber links
Shocks Blue-anodized, aluminum threaded-body, oil filled

WHEELS
Type Chrome finish, 2.2-in., one-piece plastic

TIRES
Type Spiked w/foam inserts

ENGINE AND ACCESSORIES
Engine DuraTrax Velocity .17
Starter Pull-starter
Carb 2-needle slide
Exhaust Tuned pipe
Fuel capacity 100cc

*Price varies with dealer

AN ADDITIONAL BONUS IS THE OVERDRIVE ST'S GUARANTEED STRESS-TECH PLASTIC PARTS.

KIT FEATURES

CHASSIS. The Overdrive's "Rigi-Frame" chassis is constructed of 2mm 6061 T6 aluminum and is anodized blue. The upper deck, which spans between the front and rear gearboxes, is constructed of the same material and basically eliminates any flexing. A slot cut into the bottom of the chassis below the flywheel allows you to use a starter box, if the need arises. A similar slot beneath the upside-down-mounted steering servo allows easy access to the servo-horn screw. All the electronics are on the left side of the chassis, with the throttle servo and a molded plastic box that houses the receiver, receiver battery pack and on/off switch mounted toward the rear. Next to the steering servo is the servo that controls the reversing mechanism for the transmission. On the opposite side of the chassis rests the large, .17-size motor and 100cc fuel tank.

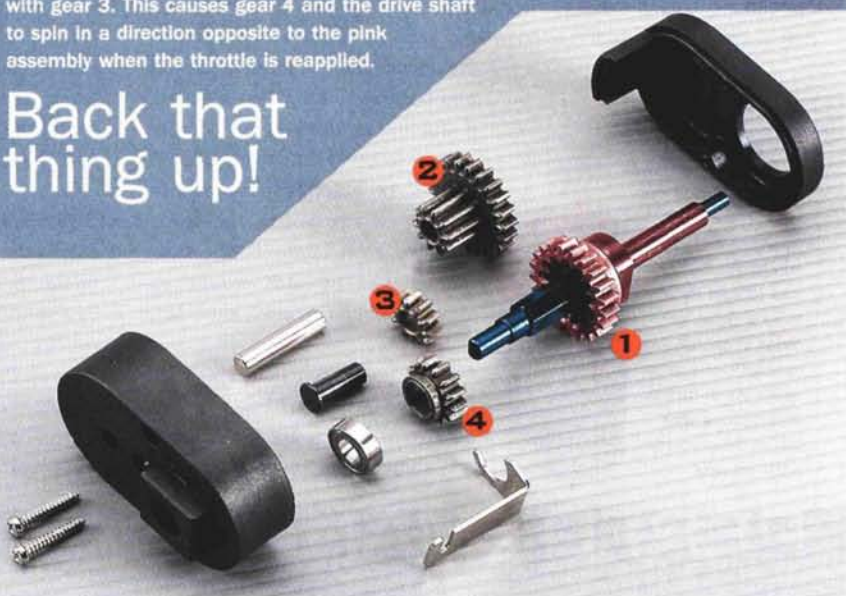
DRIVE TRAIN. The "Double Shift" transmission that produces two speeds in forward and two speeds in reverse is the highlight of the drive train. Situated just ahead of the dual spur gears is a servo-activated reversing mechanism that makes this possible (see the photo at right for details). If you find yourself up against an obstacle, just flick the toggle on top of the transmitter, and reverse is engaged. To switch back to forward, bring the Overdrive ST to a stop, flip the toggle, and you'll be back in action. How cool is that?

A centrally mounted 2-speed transmission transfers power from the Velocity .17. The shift point where the second gear kicks in is adjustable and has been factory-set. If you decide to change the setting, do not change the shift point until after you have broken in the engine. Bringing the Overdrive ST to a stop and positioned just ahead of the 2-speed is a cam-activated metal disc brake with padded calipers. Steel dogbones extend from the center of the chassis and mate with bevel-gear diffs to provide full time 4WD. The diffs felt a little notchy but should smooth out after a few runs. The front wheels are driven by steel universal-joint drive shafts similar to MIP CVDs; the rears are driven by steel dogbones. A complete set of 20 shielded ball bearings keeps the drive train spinning smoothly.

DuraTrax's reversing transmission design is simple and clever; this exploded view (along with some Photoshop tinting of the parts) shows how it works: the spur gears (not shown) are attached to the pink assembly. The blue drive shaft spins inside the pink assembly. Gear 4 is keyed onto the drive shaft. In forward operation, gear 4 sits inside of gear 1, causing the drive shaft to spin with the pink assembly. Gears 1, 2 and 3 constantly mesh with one another in forward or reverse.

When the toggle switch on the transmitter is flipped for reverse, the servo pulls the metal fork that captures gear 4 and causes it to move up the drive shaft and mesh with gear 3. This causes gear 4 and the drive shaft to spin in a direction opposite to the pink assembly when the throttle is reapplied.

Back that thing up!



SUSPENSION AND STEERING. An additional bonus of the Overdrive ST is the guaranteed Stress-Tech plastic parts. The guys at DuraTrax are so confident of these parts' durability and quality that they will make any needed replacements in the first 12 months you own the truck. This basically covers all the suspension components, so remember: save your receipt.

The shock towers are made of the same 6061 T6 aluminum as the chassis plate, but at 3mm, they are a little beefier. Blue-anodized "Rapid-Tune" aluminum shocks with threaded bodies and knurled aluminum preload adjusters are mounted on the towers. The shocks even come conveniently filled with oil, and my set needed no adjusting. You can make fine adjustments to the suspension by moving the top of the shock to one of the six

& ACCESSORIES

DuraTrax transmitter and RX-200 receiver

Futaba manufactures the pistol-grip radio gear for DuraTrax, and the gear is of typically high quality. The radio system arrives factory-installed and includes 12 AA alkaline batteries for the transmitter and receiver pack. A toggle switch on top of the transmitter allows you to shift between forward and reverse.

The radio features a third channel for forward/reverse shifting, throttle and steering trims, LED battery-status indicator and a recharging jack for use with optional Ni-Cd batteries.

DuraTrax SX-100 servos

These are relabeled Futaba S3003 standard servos that are good for about 40 oz.-in. of torque. Three SX-100s are assigned to handle the steering, throttle and reversing mechanism.

Startup video

DuraTrax has put together a very informative video on engine starting, break-in, tuning and maintenance. Regardless of your experience, take time to watch the video, as it has a significant advantage over an instruction manual: sound. Novices will appreciate the audible distinction between an engine that has been set to the correct fuel/air mixture and one that has a too rich or too lean setting. So watch the video!

Other stuff

Properly completing this RTR kit, DuraTrax includes the "nitro starter pack" that comes with a 250cc fuel bottle for easier refueling and a glow starter with a C-size alkaline battery to light up the Velocity .17. A four-way nut driver and a turnbuckle wrench complete the package.

YOU'LL NEED

- Fuel; that's it.

FACTORY OPTIONS*

- Aluminum suspension arms (blue, upper/lower)—item nos. DTXC9743/DTXC9559
- Aluminum steering bellcrank (blue)—DTXC9449
- Aluminum hub carrier (blue)—DTXC8055
- Aluminum hinge-pin plate (blue)—DTXC8022
- Aluminum rear hub (blue)—DTXC7997

*Partial listing; additional option parts available



holes in the shock tower or to one of the three holes in the lower H-arm.

The upper camber links on the Overdrive ST are unlike anything I have ever seen. A metal turnbuckle connects a ball link and a part that looks something like a tuning fork. This "tuning fork" connects to both sides of the C-carrier, which in turn provides added rigidity—more than a link with just a single connection point. The ball link is connected to the shock tower with a choice of five mounting positions.

A dual-bellcrank system is used on the steering. The steering pivots on steel pins and is secured at the top and bottom by the chassis plates. A built-in servo-saver is incorporated into the left steering pivot. A 2mm-thick aluminum plate with turnbuckle-equipped tie rods attached to it connects the bellcranks. The tie rods extend to stout aluminum steering knuckles.

ENGINE AND ACCESSORIES.

DuraTrax's Velocity .17 engine brings the Overdrive ST to life. The Velocity .17 comes factory-installed and

boasts features such as true ABC construction (aluminum piston and brass cylinder liner with chrome plating), a slide carburetor with adjustable high- and low-speed needle valves, a heavy-duty connecting rod, an oversize cylinder head and a heavy-duty recoil starter. An oiled-foam-element air filter handles the air-intake duties; the exhaust exits the side of the engine and travels through a black tuned pipe. DuraTrax's "Max-Sized" 100cc fuel tank feeds the engine.

A welcome addition not usually found on today's nitro trucks is a throttle return spring. This little safety device can prevent a runaway truck from suffering a costly crash. One side of the spring is attached through a small hole in the lower cylinder-head fin; the other end is hooked to the top of the throttle arm on the carburetor. If your radio fails for some reason, the spring returns the throttle to idle.

BODY, WHEELS AND TIRES. DuraTrax includes a trimmed, lightweight polycarbonate body with a multi-colored paint scheme; all you have to do is put on the stickers. Six color choices are available, with each color scheme tied to a specific frequency. To avoid radio interference, if your friend wants to run his Overdrive ST with yours, make sure it is a different color.

Eye-catching, chrome-finished wheels and spiked dirt tires with foam inserts accompany the sweet-looking body. They arrive already glued, but it is still a good idea to check and make certain the bond is strong—especially with chrome wheels.

TEST GEAR

DuraTrax Red Alert Nitro Racing Fuel

DuraTrax claims that using Red Alert will make your nitro-powered engine run faster, better and longer, thanks to its unique formula of castor and synthetic oils. It is available in quarts and gallons with 10- or 20-percent nitro content.



PERFORMANCE

Before I even fueled up the Overdrive ST, I watched the included engine video. It gives some great examples of what the engine should sound like when it has been properly tuned and when it has been set too lean or too rich. The Velocity .17 runs great; it started on the first pull and continued to run throughout the extremely rich settings of break-in. For the required four to five tanks of fuel, I slowly ran the truck on my driveway, and with each new tank, I set the engine progressively leaner. After this painstaking but important process, it was time for some off-road thrashing.

The first thing I like to see is a vehicle's top speed—especially if it's nitro powered. I set up the Overdrive ST at one end of a long stretch and nailed the throttle. At about the 60-foot mark, the second gear kicked in and the speed increased considerably. I ran the straightaway a couple of times and listened to see whether the engine

was tuned correctly. It sounded a little rich, so I turned in the needle valve an $\frac{1}{8}$ turn and was then satisfied that I was getting top speed out of the Velocity .17. I pulled out the radar gun, and the truck registered 33.7mph.

Next on my to-do list was to check out the truck's reverse feature. I completely stopped it, flipped the toggle switch and gave it some throttle; it backed up without any harsh grinding sounds or hesitation. It worked flawlessly, but be sure to come to a full stop; otherwise, you risk damaging the gears in the reversing mechanism.

The stock spiked wheels worked great on loose dirt and made some fairly tight maneuvers possible. On harder packed surfaces, the tires did not grip as well, but they made for some awesome rally-style power slides. The Overdrive ST also aired nice and level over jumps but bottomed out when pushed to tackle the bigger jumps. Over

washboard-like surfaces, the truck stayed its course while the suspension soaked up the bumps. I am happy to report that after several tankfuls of off-road abuse, the Overdrive ST proved DuraTrax's claims of durability. The only problem I noticed was that some screws vibrated loose, but this was easily fixed with some thread-lock.



THE OVERDRIVE ST PROVED DURATRAX'S CLAIMS OF DURABILITY.

LIKES

- Truly ready to run.
- Smooth-operating reverse mechanism.
- Sharp-looking chrome wheels and painted body.

THE VERDICT

The Overdrive is full of new (and cleverly named) features: "Rigi-Frame" chassis, "Rapid-Tune" shocks, "Max-Sized" fuel tank and "Double Shift" transmission, to name a few. The Velocity .17 engine proved to be reliable and powerful, and the chassis handled off-road running quite well, and the diffs smoothed out, as I hoped they would. DuraTrax also made an extra effort to equip the Overdrive with everything you'll need to get out running on the track or backyard, right down to transmitter and receiver batteries; just buy some fuel, and you'll be gone! Stadium-truck-style knobbies combined with 4WD and a strong-running 2-speed drive train (with reverse, just in case) give the Overdrive ST monster-truck-like all-terrain capability with better handling than a high-riding flatbed. All in all, the Overdrive ST is a good-looking, high-performance play machine with a unique spin on the RTR nitro truck formula. ■

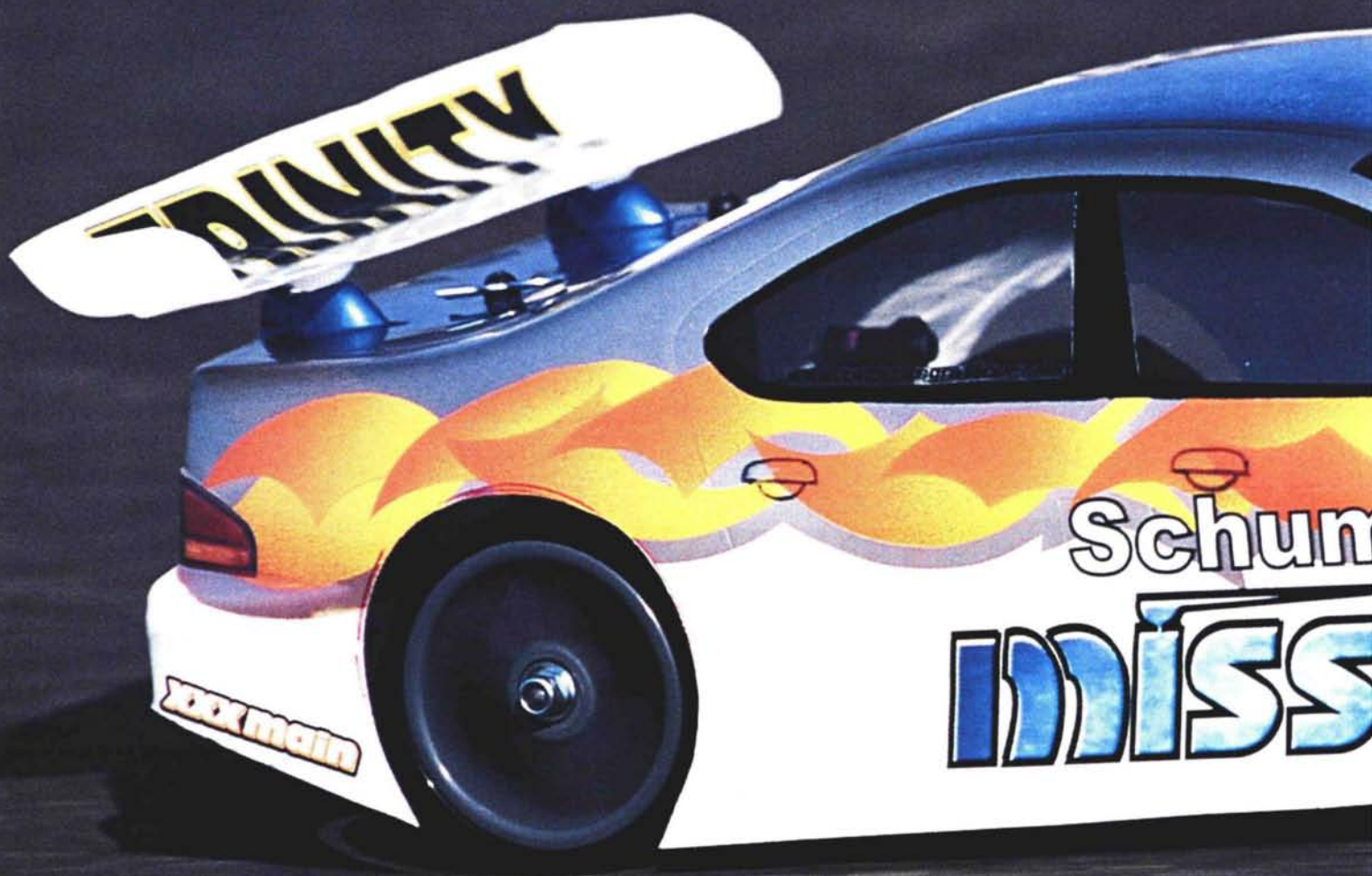
DISLIKES

- Diffs were a little notchy when new.

SOURCE GUIDE

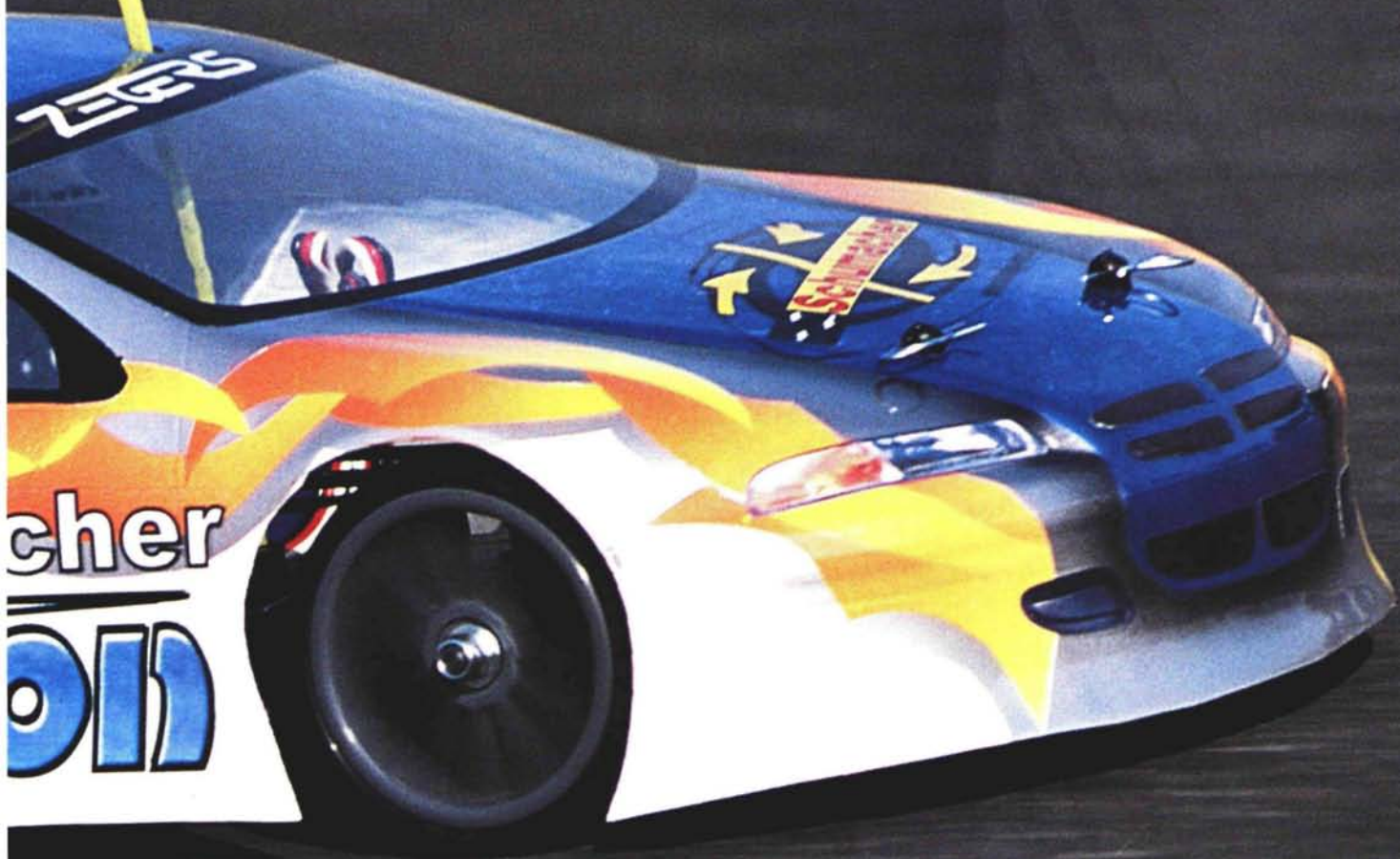
DURATRAX Distributed by Great Planes Model Distributors (800) 682-8948; www.duratrax.com.

Schumacher Mission Carbon



SCHUMACHER IS NO STRANGER TO THE COMPETITION TOURING-CAR SCENE and has proven itself on the racetrack with a long list of wins and no less than eight national titles attributed to its SST series of sedans. Schumacher retired the SSTs with the release of the Axis—an innovative, no-top-deck design with a unique layered chassis that was fast on asphalt and competitive on carpet but not quite as easy to drive on the fuzzy stuff. And that brings us to the latest Schumacher tourer, the Mission. The molded-suspension components return from the Axis, but the rest of the car is all new. New parts, new name; but can the Mission preserve the race-winning tradition of the SST series?

PHOTOS BY WALTER SIDAS



BRITAIN'S
BEST YET

track test

SCHUMACHER MISSION CARBON



The carbon-fiber battery brace is cool! The underside is scalloped to hold the cells.

The tie rods look like titanium, but they are actually steel. The front suspension's caster, camber and toe are easily adjusted.

DATA CENTER

VEHICLE TYPE 1/10-scale, 4WD competition electric touring car

BEST BUYER Competition racer

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Very good

Parts fit/finish Very good

Durability Very good

Overall performance Very good

SPECIFICATIONS

MANUFACTURER Schumacher

MODEL Mission Carbon

DISTRIBUTED BY Schumacher USA

SCALE 1/10

STREET PRICE \$279*

DIMENSIONS

Wheelbase 9.96 to 10.2 in.

(253 to 259mm)

Width 7.96 in. (202mm)

WEIGHT

Total, as tested 51.2 oz. (1,452g)

CHASSIS

Type Double deck

Material Carbon fiber

DRIVE TRAIN

Type Dual-belt 4WD

Primary (pinion/spur)

17T,21T/46T,49T

Primary drive ratio 2:1

Optional final drive ratio 1.88:1

Drive shafts Plastic universal CV axles

Differentials Ball

Bearing type Metal-shielded

SUSPENSION

Type F/R Pivot ball lower A-arms with upper wishbones

Damping Aluminum body, fluid-damped, coil-over shocks

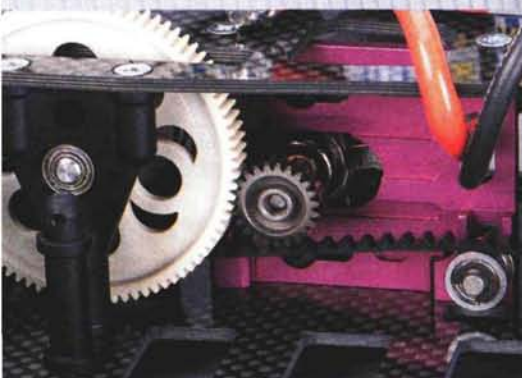
WHEELS

Type Plastic 12-spoke

TIRES

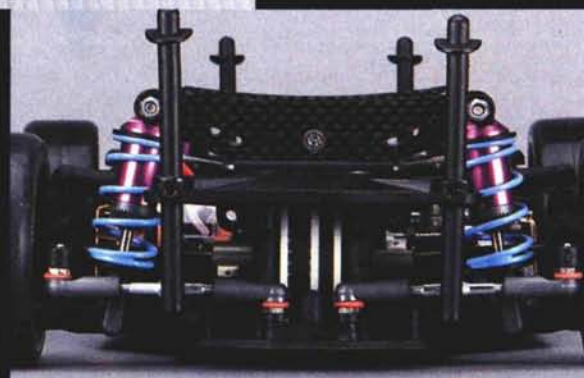
Type Schumacher belted LP-24 rubber slicks with molded inserts

* Price varies with dealer.



Left: the alloy motor mount is standard equipment on the Mission. The ball-bearing belt tensioner prevents the belt from skipping under heavy loads. You can also see that the motor mount gives you a space through which to route the battery wires.

Right: the new drive train has an extra-wide pulley in the rear. This ingenious setup routes the main belt from diff to diff. The result is a super-free drive train. Rear toe is adjusted in two ways: inboard by the arm mounts and outboard by the turnbuckles.



TECHNICALLY, THE MISSION IS A DUAL-BELT CAR, BUT IT INCORPORATES A UNIQUE DESIGN.

KIT FEATURES

CHASSIS. The first thing you'll notice is the Carbon edition's sweet, woven graphite chassis and upper deck. This material replaces all the S1 composite found in the standard Mission kit. Once you've finished drooling over the looks of the chassis, you'll also notice that the Axis 2's double-layer chassis has been scrapped for a more conventional single-layer chassis and upper deck. The battery slots have been machined out of the chassis' right side at a slight angle to put as much weight as possible toward the chassis' center. The top deck not only gives the Mission stiffness but also sandwiches the bulkheads and transmission mounts. Like most woven-graphite parts, the edges should be filed to prevent the chassis from catching an edge and slowing the car in corners, especially on carpet. Just remember to CA the edges to prevent the layers from splitting.

DRIVE TRAIN. Technically, the Mission is a dual-belt car, but it incorporates a unique design. The 86-tooth spur gear spins the layshaft and is supported by twin molded-plastic layshaft mounts. Schumacher gives a choice of using either a 17- or 20-tooth pulley on the layshaft to adjust the gear ratio. The preassembled rear differential looks different because it has a tandem set of pulleys. One pulley supports the long belt that travels up to the front differential, and the other supports the small belt coming from the layshaft. A ball-bearing belt tensioner combined with the large-diameter diffs and 3.5 mm belt prevent the belt from skipping under heavy loads. Both diffs are supported by molded bulkheads, which are brand-new. The two-piece bulkhead sandwiches the large 10x15mm bearings. The motor mount—a weak point of the Axis 2—has been upgraded to the aluminum "speed secret" part from the Axis 2. The old composite was subject to heat distortion. The new aluminum mount gets rid of this and provides extra heat dissipation.

Plastic CV-axes on all four corners will work for most motors. The plastic axles reduce rotating mass, and that results in quicker acceleration. But if you start dropping down to wacky 7-turn hand-wound mods, you may want to consider adding Schumacher's optional steel universals to better resist twisting under load. Plastic hexes transfer the power to the wheels, and all the rotating parts of the drive train spin on metal-shielded bearings. The finished drive train, even before break-in, was very free-running.

SUSPENSION AND STEERING. If you are familiar with Schumacher touring, then the suspension will look familiar—and that's a good thing! The

suspension uses a lower arm with a single pivot ball to support the hub carrier for both the front and rear. The rear suspension mounts give you several tuning options that include in- and outboard toe-in, anti-squat, wheelbase and droop. Up front, you get similar options with in- and outboard toe-in and droop adjustments. The car's front end has an upper wishbone to control caster and camber; the rear wishbone allows only camber adjustments. The standard caster spacers let you change the caster from 6, 8.5, or 11 degrees. The hub carriers and suspension mounts both offer adjustments: the hub carriers to change the camber-link position and the suspension mounts to change the roll-center. All suspension adjustments are explained in the manual, which offers a great reference for dialing the Mission in for any track condition or driving style.

Both shock towers are of the same material as the chassis and upper deck. With the S1 kit you get S1 towers; Carbon kits get carbon towers. They are held onto the molded mounts with one screw and use locating tabs to keep them perpendicular to the chassis. The towers offer five shock-mounting positions on the car's front and rear: position the shocks more upright to make the car react quicker to inputs, or move them in for a softer feel.

The shocks are all aluminum with Schumacher's own adjustable pistons. The piston is actually composed of two parts—an inner and an outer piston. By rotating the inner piston, you can select from one to four holes being opened. Depending on track conditions, you can change from a hard to a soft setting. Foam-volume compensators are used in the stock units. The foam compresses as the shock shaft enters the shock body. The less air in the shock, the more consistent the damping. Double O-rings ensure that the oil stays inside the shocks, and a plastic cap seals the bottom-loading shocks.

Steering is handled by a servo mounted on the chassis' left side. It uses a ball-bearing dual-bellcrank system. An adjustable-tension servo-saver protects the servo from those accidental meetings with the boards. The Ackerman link is now a threaded rod, and beefy turnbuckles allow easy adjustment of toe-in.

BODY, WHEELS AND TIRES. The Mission is sold naked—no body. Schumacher leaves the choice of shells to the racer. The kit includes a set of new, gray, 12-spoke rims that are a nice change from the boring dish wheels found in most kits. A set of belted Schumacher LP-24 slick tires and molded medium inserts are included.

BUILDING & SETUP TIPS

Schumacher does an excellent job of guiding you through building the Mission. Clean CAD drawings walk you through the construction and make building the Mission no mission at all. With the preassembled diffs and prethreaded upper camber links, an experienced builder will whip through the kit in a few short hours. Do yourself a favor and get the correct Posi driver for the kit's unusual screws; Schumacher sells the tool you need.

YOU'LL NEED

- Transmitter and receiver
- Steering servo
- Electronic speed control
- Motor
- 6-cell battery
- 190mm body
- Tire glue

BREAK OUT THE FILE. You'll have to prep the chassis before you hit the track, especially if you race on carpet. Basically, smooth all the edges to prevent them from catching and slowing the car down in the corners. It isn't hard to do but will take a few minutes. It's also recommended that you seal the layers with CA glue to prevent them from splitting in a crash.

BUILD RIGHT. It pays to build it right from the get-go. Measure the shocks and set the ride height with a caliper

or ruler before you arrive at the track. You might be tempted to hit the track before you've set your shocks up correctly, and that could frustrate you.

ELECTRONICS PLACEMENT. Like most cars with the electronics all on one side, room is tight. If you are getting new equipment, go for the smaller stuff; it fits and looks better. Schumacher recommends putting the receiver under the top deck, with crystal access through the top deck.

SETUP The kit settings worked well on pavement; for you carpet guys, check out this setup. For more setups, visit www.rccaraction.com and follow the links to the bulletin board. You'll find a forum dedicated to Schumacher cars where a racer, or someone from Schumacher USA, will answer any question.

HIGH-TRACTION CARPET SETUP WITH FOAM TIRES:

	FRONT	REAR
Toe (degrees)	2 (anti-dive)	2.5 (outboard)
Ride height (mm)	4	4.5
Camber (degrees)	-1	-1
Camber link (inner/outer)	Positions 1 & 2	Positions 1 & 2
Droop (mm)	1.5	2
Caster (degrees)	7	Not applicable
Swaybar	U2245	Stock
Arm spacing	Rear	Middle
Differential	Diff	Diff

SHOCKS

Mounting location(upper/lower)	Positions 1 & 1	Positions 1 & 1
Oil	80WT	80WT
Piston	1-hole	1-hole
Spring	Silver	Silver
Length (mm)	67	67
Limiters	None	None

LRP Quantum Competition

The Quantum Competition's micro-size and convenient user-replaceable power wires make it attractive for all race cars (especially those with limited chassis space), but there's more to the Quantum than compact engineering. LRP somehow managed to pack a bunch of innovative features into the blue box as well, including "Punch Control," which functions like a current limiter but doesn't reduce top



speed, even at its lowest setting. Digital Engine Power Mapping dials in the speed to suit track conditions and available power, and with a motor limit of five turns (which is really no motor limit at all), there's no race situation the Quantum Competition can't handle.

Other items used to complete the Schumacher Mission:

Airtronics M8 transmitter

KO Propo PDS-947FET steering servo

LRP Phaser receiver

Trinity P2K2 stock motor

Trinity Panasonic Stock Metal Hydride Team Pack

Hot Bodies 190mm Stratus body

Jaco Double purple/purple foam tires

PERFORMANCE

We tested the Mission on a pavement-and-pipe practice track set up on fresh—but

THE MISSION GIVES UP NOTHING IN THE TURNS.

not too fresh—blacktop with a tight infield layout and long, fast front and back straights. From the first pull of the trigger, the Mission revealed its acceleration prowess as it launched instantly down the front

straight. Schumacher's new belt setup feels nearly frictionless on the bench, and on the track, it made the Trinity P2K2 stocker feel like a mod. That's great, of course, but it's a small advantage if the Mission has to scrub off more

LIKES

- Silky looks and excellent handling.
- Huge range of adjustments.
- Carbon version saves money.
- Friction-free innovative drive train.

speed than its competition to make a turn. Based on our tests, the Mission gives up nothing in the turns. A little understeer is expected of a full-time 4WD car, but even without a front one-way, the Mission carried a lot of speed through the fastest corners and still had a lot of steering when we grabbed the brakes to set up for hairpins. A one-way will no doubt improve the Mission's handling on fast, sweeper-filled tracks, but the double-diff setup is probably better for most shop tracks.

The Mission also showed very good transitional handling and slalomed through chicanes with plenty of hustle. The stiff carbon chassis helped the suspension do its job, and the kit setting worked well. Nonetheless, we tweaked the rear toe (easily done without disassembly, thanks to the clever turnbuckle toe-link system), and we tried a few camber changes. We didn't always make changes for the better, but the Mission responded well to all changes in that small tweaks resulted in small changes in handling; some cars "go away" completely with as much as one false turn of the turnbuckles, and that makes tuning very frustrating. This wasn't the case with the Mission.

THE VERDICT

The Mission's rich race heritage has clearly played a major role in its development, and this is, without doubt, Schumacher's best car yet. The instruction manual and high-quality parts made assembly a pleasure, and built to the factory settings, the car should be ready to race competitively straight out of the box. But even if the kit settings aren't dialed for your track, the Mission's easy adjustability and predictable response to tuning changes should have you on an A-main pace with a few turnbuckle twists and a splash of shock fluid. Mission accomplished. ■

DISLIKES

- Uncommon Posi screw heads.
- Low-turn mods may twist the plastic CV-axes.

SOURCE GUIDE

HB RC OPTION PARTS (562) 568-1121; www.hotbodiesonline.com.

KO PROPO USA INC. (310) 532-9355; www.kopropo.co.uk.

LRP Distributed by Team Associated, (714) 850-9342; www.teamassociated.com.

SCHUMACHER (813) 889-9691; www.racing-cars.com.

TRINITY PRODUCTS INC. (732) 635-1600; www.teamtrinity.com.

THE COMPETITION

	DRIVE TRAIN	CHASSIS	DIFFS (F/R)	SHOCKS	BALL BEARINGS	STREET PRICE**	REVIEWED
Associated TC3 Factory Team	Shaft	Plastic composite	Ball	Threaded aluminum	Teflon sealed	\$299	5/01
HPI RS4 Pro 3	Dual belt	Plastic composite	Ball	Threaded composite	Rubber sealed	\$219	7/01
Kyosho KX-One	Single belt	Graphite plate	One-way/ball	Aluminum	Metal shielded	\$380	10/01
Schumacher Mission Carbon	Dual belt	Graphite plate	Ball	Aluminum	Metal shielded	\$280	05/02
Team Losi Triple-XS	Single belt	Plastic composite	Ball	Hard-coated aluminum	Teflon shielded	\$229	10/01
XRAY T1	Dual belt	Graphite plate	Ball	Threaded plastic	Metal shielded	\$325	11/01

Partial list; category is too large to list all competitive vehicles. **Approximate; price varies with dealer.

XTM Racing Baja Bullet



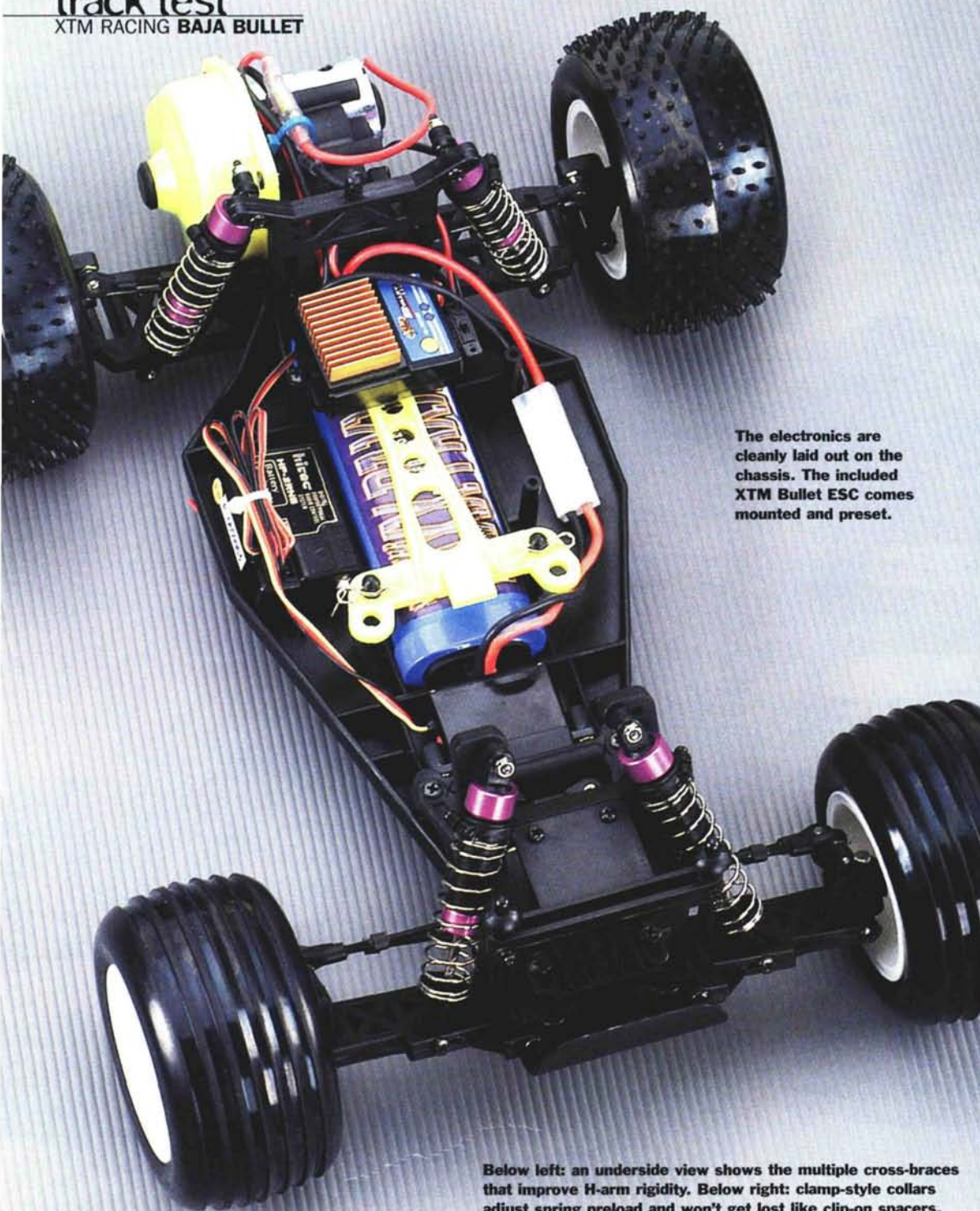
PHOTOS BY WALTER SIDAS



BIG FUN

for small change

ARE YOU LOOKING FOR AN OFF-ROAD TRUCK WITH AGILITY, QUICKNESS AND DURABILITY? A stadium truck may be just your ticket. These trucks have a low center of gravity and a wide stance for stability, are constructed of tough, lightweight materials for speed and strength, use a large suspension travel to soak up off-road obstacles and are finished off with a truck body, wheels and tires. It's easier than ever these days to get behind the wheel of these off-road racers thanks to the explosion of the ready-to-run (RTR) market. XTM Racing fuels this explosion with the release of its electric Baja Bullet RTR. This stadium truck comes assembled and features a 21-turn motor, ESC, full ball bearings, a painted body with decals and an installed pistol-grip radio system. Let's take a closer look.



The electronics are cleanly laid out on the chassis. The included XTM Bullet ESC comes mounted and preset.

Below left: an underside view shows the multiple cross-braces that improve H-arm rigidity. Below right: clamp-style collars adjust spring preload and won't get lost like clip-on spacers.



THE SUSPENSION COMPONENTS AND STEERING BELLCRANKS ARE MOUNTED ON A STIFF METAL KICKPLATE, AND A TOUGH FRONT BUMPER PROTECTS THIS SETUP.

DATA CENTER

VEHICLE TYPE 1/10-scale RTR electric 2WD stadium truck

BEST BUYER First-time and intermediate RC'ers interested in electric off-road

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions Good

Parts fit and finish Good

Durability Very good

Overall performance Good

SPECIFICATIONS

MANUFACTURER XTM Racing

MODEL Baja Bullet

DISTRIBUTED BY Global Hobbies

SCALE 1/10

STREET PRICE \$180*

DIMENSIONS

Wheelbase 10.75 in. (273mm)

Width 11.25 in. (286mm)

WEIGHT

Total, as tested 60.95 oz. (1,728g)

CHASSIS

Type Molded semi-tub

Material Plastic

DRIVE TRAIN

Type Enclosed gearbox

Primary Pinion/spur gear

Drive shafts Dogbones

Differentials Bevel gear

Bearing type Shielded ball bearings

SUSPENSION

Type Lower H-arm with turnbuckle camber links

Shocks Plastic-body, oil-filled

WHEELS

Type One-piece plastic

TIRES

Type (F/R) Soft-rubber rib tread/spiked tread

*Prices vary with dealer.

KIT FEATURES

CHASSIS. The Baja Bullet's tub-like molded chassis is made of plastic; the battery compartment and strengthening ribs add rigidity. The battery compartment is just large enough to fit a 6-cell pack. The battery tray tucks under the chassis' ESC tray and is secured with a bright yellow plastic strap. The chassis sides are swept slightly upward for better obstacle clearance during cornering. A metal, rear chassis plate supports the rear gearbox and suspension. The suspension components and steering bellcranks are mounted on a stiff metal kick plate, and a tough front bumper protects this setup.

DRIVE TRAIN. Instead of a stock 540 motor, XTM specs a 21-turn sealed-endbell motor to get things moving. The truck has a conventional pinion/spur-gear arrangement, and the spur shaft is driven by a friction-peg slipper clutch that is similar to the one used on the Traxxas Rustler. The gear cover is molded with an access hole for easy clutch adjustment. A heavy-duty bevel-gear diff, instead of the ball variety, keeps the Baja Bullet economical. The outriggers are fastened to the differential's output-shaft with setscrews, and dogbones carry power to the hubs. For improved performance, the entire drive train spins on shielded ball bearings.



A slipper clutch is a welcome feature to save those tranny gears. The nut and spring for slipper adjustment are clearly visible.

SUSPENSION AND STEERING. Four oil-filled plastic-body shocks with purple-anodized aluminum caps cushion the Baja Bullet on rough terrain, and spring preload is easily changed because of the clamp-style plastic collars.



Included turnbuckles make camber and toe adjustments a cinch.

Bullet's large offset wheels bring its stance to a similar width. Steel turnbuckles fitted with ball ends make up the upper camber links and steering tie rods. A servo-saver rides the output shaft of the steering servo with a fixed plastic link that's connected to the twin bellcranks.

BODY, WHEELS AND TIRES. To maintain the Baja Bullet's RTR status, XTM includes a painted and trimmed polycarbonate body. The only thing you'll need to do to complete the stadium truck body is apply the stickers. Unlike some other RTR trucks, XTM leaves the windows clear instead of using black stickers; it's a minor detail, but clear windows greatly enhance the overall look of the finished product. The stock wheels and tires have been factory mounted and glued, and they are standard issue for a stadium truck—one-piece plastic wheels with ribbed tires up front and spikes in the rear.



INCLUDED ELECTRONICS & ACCESSORIES

Hitec Lynx Sport transmitter and receiver

This basic 2-channel pistol-grip AM radio system from Hitec gets you running asap. The steering and throttle controls are smooth and provide a nice feel while driving. The Lynx Sport features include servo-reversing, two LED battery indicators and LED low-power flashing indicator, removable crystals, steering and throttle trim and an external charging jack.

Hitec HS-303 steering servo

The Hitec HS-303 servo proves reliable for entry-level use. It provides more than enough torque to steer the wheels.

XTM Bullet ESC

The included Bullet ESC is a dependable component. It is pre-programmed, but if you ever need to reset the unit, its one-button setup is a cinch. For beginners, the owners' manual gives detailed instructions on how to set up an ESC.



YOU'LL NEED

- 6-cell battery pack
- 8 AA alkaline transmitter batteries
- Charger

**Trinity Maxx Pxx
6-cell 1900mAh
battery pack**

These batteries are sold as a pair and are intended for the Traxxas E-Maxx truck because it needs two batteries to run. The Baja Bullet doesn't need two batteries at once, but it's nice to have more than one to go out and tool around with. It has a Tamiya battery connector and even comes with a discharging resistor; all of this for about \$45 is a pretty good deal.



**Pro-Max Activator
peak charger**

I used the Pro-Max Activator to juice up my battery packs. It's a great charger that's packed with lots of features such as AC/DC operation, a digital voltmeter that shows voltage/ampereage and elapsed charge-time readout for peak voltage, and it will even test a pack before it begins to charge.



PERFORMANCE



**ITS OVERALL SPEED WAS A NICE SURPRISE:
THE TRUCK PRODUCED A RADAR-CONFIRMED
TOP SPEED OF 18.8MPH**

I charged my battery packs and headed out to a nearby park to run the Baja Bullet. It was a perfect place to test a stadium truck because of the hard- and soft-packed surfaces combined with relatively steep elevation changes. From the first squeeze of the trigger, I noticed that the gearbox seemed louder than those of other trucks. I checked the pinion- and spur-gear mesh and found it a little tight. After I had respaced the gears by slipping a piece of paper between them, the gearbox was much quieter, although the hard-plastic gear cover does tend to resonate and make normal gear noise more apparent.

The Baja Bullet handled the park's terrain relatively well. The smaller mounds and dips were easily soaked up by the long suspension travel, and when launched over hills, the chassis flew fairly level, but it did bottom out on landing. Tracking straight on the rough stuff was controlled with the usual steering input, and in turns, the front end pushed a great deal. Reducing the front spring tension improved this trait. After a few battery packs, the Baja Bullet was still in one piece with just normal scratches and dings on the chassis and body.

LIKES

- Durable construction.
- Fully loaded with ball bearings.

The included 21-turn motor performed well. Adjustments to the Baja Bullet are easy thanks to the clamp-style shock collars and steel turnbuckles. Its overall speed was a nice surprise: the truck produced a radar-confirmed top speed of 18.8mph. I have been accustomed to 540 motors that are fine to begin with, but by the time I put in the second battery pack I want more speed. This motor provides that added speed without wiping out run time. All these components make the Baja Bullet a fun-to-drive stadium truck.

THE VERDICT

The XTM Racing Baja Bullet is ideal for the first-time stadium-truck buyer; it's RTR with a Hitec radio system, an XTM ESC and maintenance-reducing ball bearings, yet it is still affordably priced. The included motor provides a good compromise of speed and endurance, and most important, the Baja Bullet is just plain fun to drive.

DISLIKES

- Loud gearbox.
- Bright yellow parts make this quality truck appear toylike.

SOURCE GUIDE

GLOBAL HOBBY DISTRIBUTORS (714) 964-0827;
www.globalhobby.com.

HITEC RCD INC. (858) 748-6948; www.hitecrd.com.

PRO-MAX Distributed by Global Hobby Distributors.

XTM RACING Distributed by Global Hobby Distributors.

THE COMPETITION

	RADIO	SPEED CONTROL	BEARING TYPE	DIFFERENTIAL	CAMBER LINKS	SLIPPER CLUTCH	MOTOR	STREET PRICE**	REVIEWED
Associated RC10T3 RTR	Hitec Lynx Sport	LRP Runner	Bushings	Ball	Turnbuckles	Single-pad	20-turn	\$240	3/01*
DuraTrax Evader RTR	DuraTrax/Futaba	DuraTrax Sprint	Ball bearings	Ball	Turnbuckles	Single-pad	20-turn	\$190	2/02
Kyosho Ultima ST ReadySet	Kyosho Perfex	Mechanical	Bushings	Gear	One-piece plastic	Rulon peg	27-turn	\$190	3/01*
Traxxas Rustler RTR	Traxxas TQ	Traxxas XL-1	Bushings/bearings	Gear	One-piece plastic	None	20-turn	\$190	3/01*
XTM Baja Bullet RTR	Hitec Lynx Sport	XTM Bullet	Ball Bearing	Gear	Turnbuckles	Peg	21-turn	\$180	5/02

*See the March 2001 issue for the 2WD Sport Truck Shootout **Price varies with dealer



For most of us, the year is 2002 A.D., but if you're a hardcore monster truck fan, this is the year 2 A.T.—After T-Maxx. Since Traxxas debuted its groundbreaking (literally) monster in 2000, the big-truck segment of RC has been all about the Maxx. Is it any wonder that other manufacturers would look for a piece of the action with similarly featured trucks that reach beyond the buggy-conversion formula?

Kyosho was first to respond with its MegaForce (see the "First Look" in the February 2002 issue), and Tamiya followed closely behind with its Terra Crusher (which got the "First Look" treatment in the March 2002 issue). While both Japanese giants are clearly stalking T-Maxx territory with reversing transmissions, onboard electric starters, high-riding chassis and independent 8-shock suspensions, the Kyosho MegaForce and Tamiya Terra Crusher reached very different design destinations on their way to hobby-shop shelves. We flogged 'em both to find out how they stack up.

TAMIYA TERRA

we drive the
baddest
new
big



CRUSHER KYOSHO MEGAFORCE

by the Staff of RC Car Action

trucks

PHOTOS BY WALTER SIDAS AND PETER HALL





Quick! Which manufacturer was the first to bring a reversing transmission to nitro RC? You can thank Kyosho; its first Quick Reverse Clutch (QRC)-equipped truck was the Baja Field Beetle, circa 1997. The same QRC reversing-transmission design has a home in the MegaForce (MF), but Kyosho has beefed up the system for big-tire abuse and enclosed it to keep mud and crud out of the works.

While the MegaForce certainly is a bigger, heftier truck than previous QRC trucks, it's visibly smaller and just over 3 pounds lighter than the Terra Crusher. With that kind of weight savings, the .15-powered Mega might actually have a higher power-to-weight ratio than the Terra Crusher, despite the Crusher's displacement advantage. Overall, the MegaForce has a slick, athletic appearance; how well that appearance reflects performance will be discovered during testing.

FEATURES

QRC single-speed reversing transmission with slipper clutch. Like the Terra Crusher, the MegaForce's slipper is a dual-pad unit that pinches a relatively small spur gear—with the same benefit: less wear and tear on the slipper pads and more consistent adjustability.

GS-15R engine with Touch Starter. The MF's electric starter motor is tucked neatly beneath the exhaust manifold and drives the engine's crank via a compact gearbox. A socket on the rear shock tower interfaces with the Touch Starter, which is little more than a strap-on plug for a stick pack. It's simple, and it works; just touch the battery to the starter plug (hence, the name), and the MF comes to life.

Metal-shielded ball bearings throughout. We've said it before, and we'll say it again: you gotta have ball bearings in a big nitro truck. The MF has 'em.

Plastic-body oil-damped shocks with aluminum cap sleeves. Kyosho's "Sport" shocks are RC classics, and eight of them are put to good use on the MF. Kyosho chose an unusual shock-mounting location; instead of reaching down to the lower suspension arms, the shock bottoms are fixed to the upper arms. Gold-anodized sleeves for the top caps add a touch of style.

125cc fuel tank. The MF gives up 25cc to the Terra Crusher in fuel capacity, but remember, it is lighter and has a smaller engine. The 125cc tank is plenty big enough for this application; it's the same size as .21-powered trucks use.

Factory-glued 6x3-inch chevron-tread tires with foam inserts. The MF's chunky rubber features tall tread bars and a round profile that should minimize rolling resistance. Foam inserts are a bonus and allow a more supple carcass to be used.

Enclosed radio box. Separate compartments hold the included 4-cell receiver-battery holder and Perflex receiver, and lifting the compartments' individual, body-clip-secured hatches allows easy access to both.

Forward/reverse throttle actuator. Kyosho was the first to figure out how to use a single throttle servo to shift a transmission into and out of reverse as well as to provide proportional throttle control in both directions. It's simple, it's clever, and it works.

Steel dogbone axles and drive shafts. Universal-joint axles would be sexier, but the MF's 4mm shafts are suitably beefy and seat deeply in the drive cups.

Threaded steel tie-rods and rear toe links. Like the Terra Crusher and T-Maxx, the MF uses identical steering hubs on all four corners. Threaded links permit toe adjustments with only minor disassembly, and they open the door to 4-wheel steering possibilities (but 2-wheel steering is standard).

Cast-aluminum pipe. Kyosho is known for its multipiece cast pipes that can be disassembled for cleaning and oil drainage. The MF's header is also a multipiece casting.

Single-rotor disc brake. Kyosho sets up the MF for forward/reverse operation, and parts are included for forward/brake (no reverse) operation as well. A padded steel caliper grabs the single-rotor brake.

Aluminum chassis. A blue-anodized, 2mm, channeled aluminum plate stretches from gearbox to gearbox to give the MF an all-metal foundation. Molded braces beneath the chassis give a "ladder-bar" look as they increase rigidity and protect the under-chassis drive-train parts.

The MegaForce's Perflex radio has dual-rate steering, an LED battery meter and a comfortably thick grip. The spare linkage is for the truck's disc brake, and the high-quality box wrench is included with the kit.



INCLUDED ELECTRONICS

- Kyosho Perflex 2-channel AM transmitter and receiver
- Kyosho KS-201 40 oz.-in. steering and throttle/transmission servos

INCLUDED ACCESSORIES

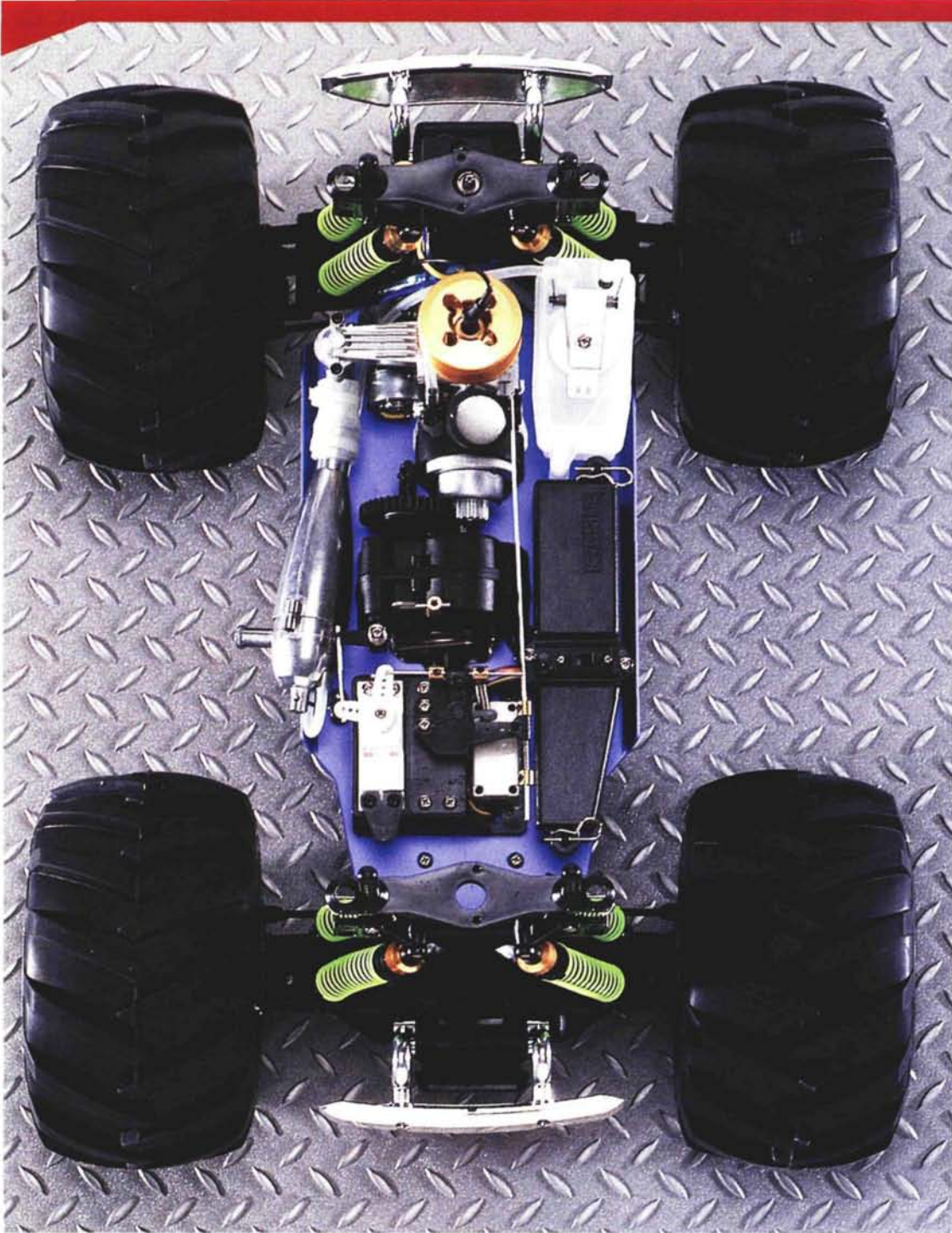
- 4-way wrench
- Starter battery adapter
- Brake linkage, preload spacers, miscellaneous tools

NOT INCLUDED

- 6-cell stick pack (for electric starter)
- Fuel
- Fuel bottle
- 12 AA batteries

SPECIFICATIONS

Length, overall	18.9 in. (480mm)
Height, overall	11 in. (280mm)
Wheelbase	12.2 in. (310mm)
Maximum ground clearance	4.125 in. (105mm)
Suspension travel	2.475 in. (63mm)
Weight (RTR)	9.25 lb. (4,200g)
Bearing type	Metal-shielded
Shocks	Coil-over, oil-filled
Suspension	Independent
Arm length	2.375 in. (60mm)
Transmission ratio	25.1:1 (forward), 34.1:1 (reverse)
Differentials	Gear
Slipper clutch	Dual pad
Engine	.15ci
Axles	Dogbones
Transmitter	2-channel Kyosho Perflex
Steering servo/torque (approx.)	Kyosho KS-201/40 oz.-in.
Throttle servo/torque (approx.)	Kyosho KS-201/40 oz.-in.

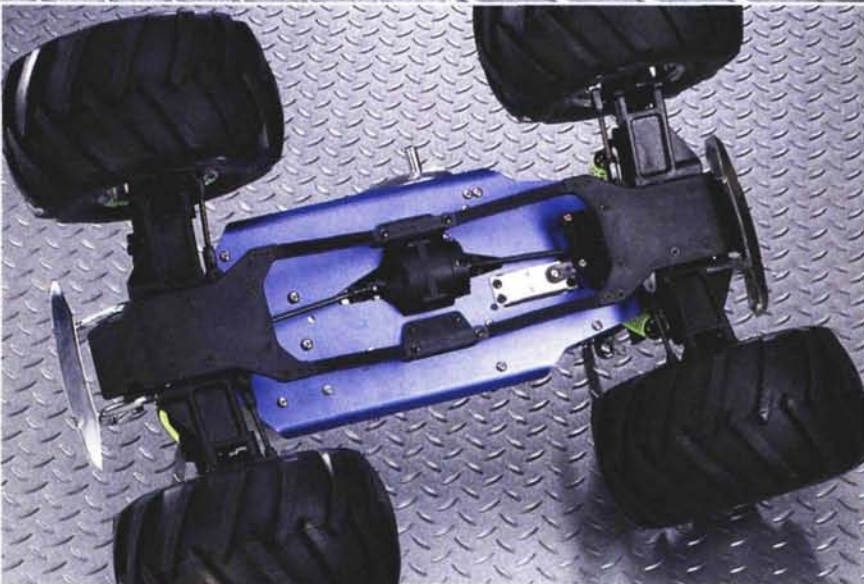


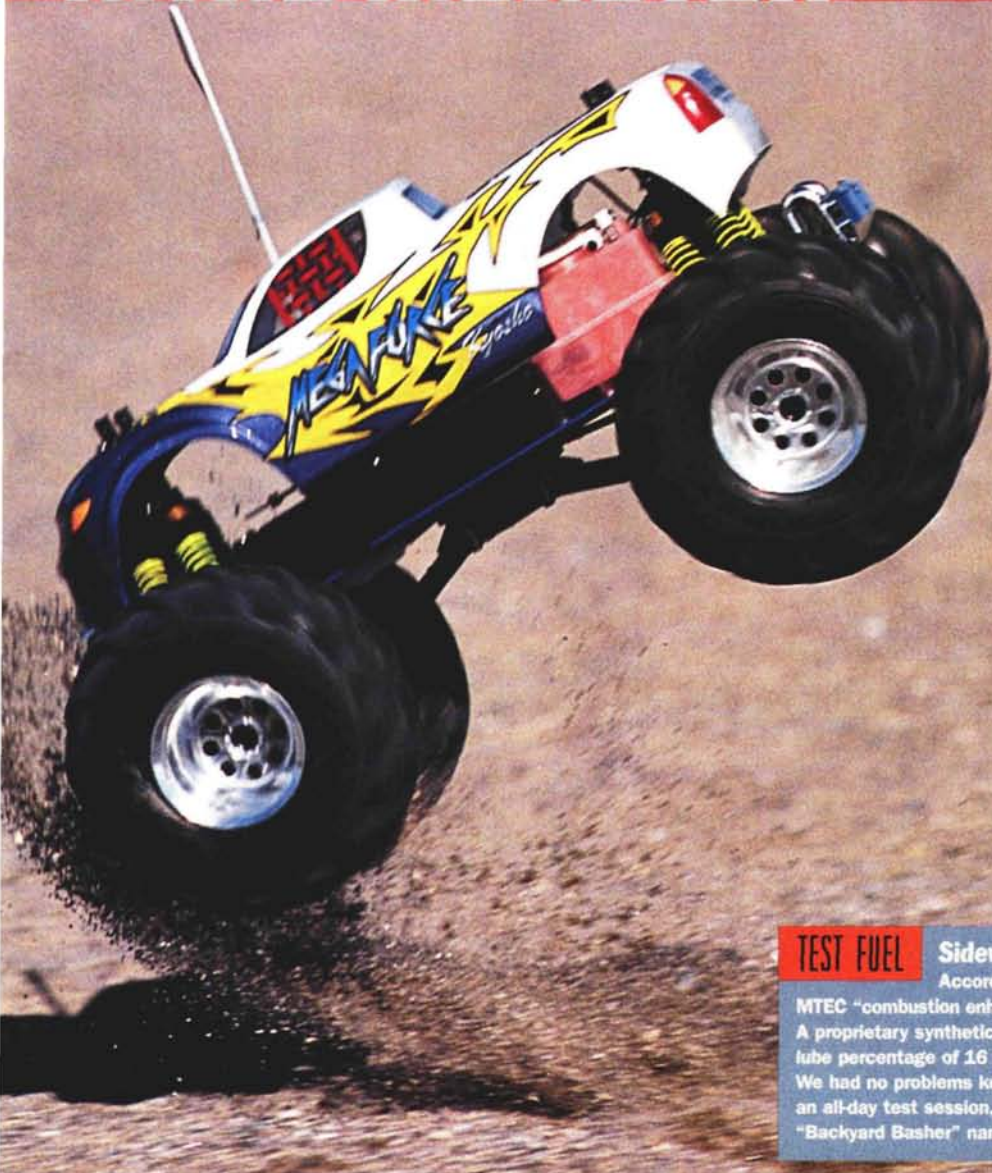
Above: the GS-15R engine ran very well throughout testing and stayed relatively cool despite its short heat-sink head. The shroud over the nose of the engine case is a nice touch.

Below: Kyosho suspends the MegaForce with a pair of Sport shocks on each corner. Note the shocks' upper-arm mounting location.



Above: Kyosho's previous version of the QRC tranny had exposed gears, but the MegaForce gearbox is fully enclosed. The spur gear is now equipped with a slipper clutch. **Right:** molded "ladder bars" and thick skidplates protect the QRC transmission, which is offset in the chassis. Note the short suspension arms; the MegaForce relies on its offset hub carriers and rims for its width.



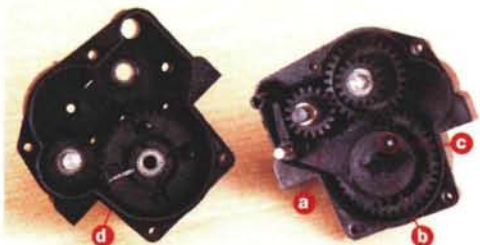


REVERSE ENGINEERING: INSIDE KYOSHO'S QRC SYSTEM

Kyosho's QRC gearbox is incredibly simple. The transmission is basically two side-by-side gear trains that are always in motion, but one gear train has an additional counter-gear to reverse its direction. A shifter fork (A) slides a clutch disc (B) that is keyed to the output shaft. When the steel drive dog (C) in the clutch disc engages either the forward or reverse gear on either side of the chassis, a drive pin (D) in the gear spins the clutch disc, which in turn spins the output shaft.



The system is simple, and it works well as long as you stop before you shift gears. Unfortunately, it doesn't include a brake that can be operated along with the reverse mechanism—at least not with a 2-channel system. There's room on the MegaForce for a third servo to serve as a dedicated shifter servo à la T-Maxx.



TEST FUEL

Sidewinder Backyard Basher 20 percent nitro

According to the Sidewinder guys, Backyard Basher contains MTEC "combustion enhancer" that helps Sidewinder fuel to burn more efficiently. A proprietary synthetic lubricant, CP-07, has been added, and the fuel has a lube percentage of 16 percent for long-term, extended-running wear protection. We had no problems keeping the Tamiya and Kyosho engines chugging through an all-day test session, and both trucks made plenty of power, but don't let the "Backyard Basher" name fool you; you can race this stuff, too.

DRIVING THE MEGA FORCE

You could argue that the MegaForce is even easier to start than the Terra Crusher—you don't even have to press a button! As soon as the Touch Starter hits the socket on the MegaForce's shock tower, the engine is good to go. Once it had been broken in, warmed up and tuned for speed, we radared the MF to see what it could do. The Kyosho .15 engine launched the MF hard off the line, but almost instantly wound out with a top speed of 18.1mph. If the MF had a 2-speed tranny, there's no doubt it would be able to run with the Terra Crusher.

While the truck's low-ish terminal velocity was apparent in the wide-open spaces of the parking lot we used for radar tests, the speed shortage didn't impact its off-road climbing and crawling. The MegaForce has a lot of torque on tap, and it will climb just about anything that isn't so steep that the truck flips over backwards—which it will do. It will succumb to the laws of physics before it runs out of grunt.

Jumping the MegaForce required a little practice, as it tended to drop its rear wheels unless we rolled off the throttle as it left the jumps or tapped reverse once it was airborne to kick the rear end back up. On touchdown, the stiffly sprung, short-arm suspension rebounded and bounced the MegaForce into a short hop, but we never lost control. If anything, it added to the fun, as we were usually able to gas it on the hop and get the MF to carry a wheelie. Pretty cool!

Kyosho's QRC transmission proved to be just about bulletproof, but it shifted noisily; the clutch disc tends to bounce off the output gear before fully engaging the drive pins, and that makes for some ugly, but apparently harmless, sounds. We purposely abused the tranny with forward-to-reverse (and vice versa) shifts at speed, which caused the truck to lock its wheels and endo but didn't break anything. (Nonetheless, don't try it at home!)

The MegaForce required a light touch on the racetrack. It's round-carass tires and high center of gravity made it very sensitive to steering inputs, and it was easier than the Terra Crusher to roll over in hard turns. The lack of a brake also inhibited control, as we had to coast into tight turns instead of braking late and then getting on the gas. Handling was much improved with the addition of a couple of degrees of front toe-in. It also helped when we disabled the transmission's reverse function so the throttle servo could instead operate the disc brake. Although still a little tipsy, the MegaForce was then much more competent in racetrack situations.

RATING THE MEGA FORCE

For beginners, the MegaForce has a lot to offer, most notably a very willing, reliable engine, a high-quality radio system, a factory-finished body and lots of monster-truck appeal. Purely performance-minded enthusiasts will wish for a 2-speed transmission and the higher top speed it would undoubtedly provide, and must choose between having brake control or reversing capability (if you want to go fast, go for brakes), but with the MegaForce Kyosho has an undeniably fun truck. For the guy who wants to open the box and tear up the backyard instead of drag racing in parking lots or putting down lap times, the MegaForce and its run-all-day engine are a great combination.



Tamiya's truck is all about being big, and with its 6.9-inch tires, 14.2-inch wheelbase, and 11.8-inch cab height, the Terra Crusher (TC) is unquestionably the leader in large. Fittingly, it also has the largest engine—a .18 electric-start mill of Tamiya's own design. A lot of engineering effort went into the gearbox (see the sidebar, "Reverse engineering"); it brings nitro-powered reversing to a new level of gear-saving seamlessness. Equally impressive is Tamiya's solution to the puzzle of delivering proportional forward/brake/reverse control with a single throttle servo; and the level of attention given to the protection of the truck's electronics and drive components from off-road crud isn't seen too often (You weren't going to get a Terra Crusher for the street, were you?).

FEATURES

Plastic-body oil-damped shocks. The Terra Crusher's top-filled, bladder-equipped shocks first served on the TXT-1, and though they look identical to Tamiya's other plastic shocks, they are beefier than those on Tamiya's buggies and 1/10-scale trucks. The shocks pass through the upper suspension arms to reach the lower arms, just like on a T-Maxx.

Forward/brake/reverse actuator. A clever cam system allows a single throttle/brake servo to give the TC fully proportional throttle in forward and reverse as well as proportional brake. It's trick.

Telescoping universal-joint axles with aluminum shafts. Tamiya got around the problem of twisted universal shafts by machining them out of aluminum. The universal joints are plastic and have steel stub axles, and Tamiya includes a set of four spares. Pay attention to the threading on the stub axles: the black axles are left-hand threaded to prevent the wheels from loosening on the left side of the truck.

Steel turnbuckle tie-rods and rear toe links. The TC's linkages are 3mm thick for toughness, and, thanks to their wide flats, are easily adjusted.

Enclosed radio box. The TC gets its "shovel-head" look from the large receiver-box hatch that dominates the front of the chassis. Three body clips keep the hatch in place over the steering and throttle servos, the receiver and the receiver battery.

Metal-shielded ball bearings throughout. You gotta have ball bearings in a big nitro truck. With the exception of the steering bellcranks, the TC is an all-ball machine.

Composite-plastic tuned pipe. The TC's pipe is molded in two pieces, and that allows it to have a divergent cone for proper tuned-pipe performance. The manifold is less appealing; it's a 90-degree casting that probably doesn't allow exhaust gases to flow as well as a mandrel-bent header would.

150cc fuel tank. Big truck, big engine; carrying more fuel just makes sense.

7x4-inch chevron-tread tires. There aren't any foam inserts in the TC's big meats; they roll on their stiff rubber construction.

FS-18 engine with electric starter. Like other onboard starter systems, Tamiya's starter uses a small electric motor to spin the crankshaft with a gear-reduction unit and simultaneously light the glow plug. Juice for the motor comes from a 6-cell stick pack (not included) that's stowed neatly in the hand-held, fuse-protected, push-button starter unit.

Dual-rotor disc brake. With a 47mm diameter, the twin rotors provide plenty of clamping area for the TC's triple steel calipers.

Reversing transmission with clutch-type 2-speed. No slam-bang "finger" shifters here; the TC uses an easy-on-the-gears clutch-type 2-speed. Two shoes do the grabbing, and the shift point is externally adjustable.

Adjustable slipper clutch. Instead of relying on a dinner-plate-size spur gear to provide gear reduction, the TC transmission's internal gears do the reducing. This allows the use of a relatively small spur gear, so the TC's slipper doesn't have to contend with the leverage of an oversize spur gear.

Steel universal-joint center drive shafts. The center drive shafts of a heavy 4WD truck must handle considerable loads, so Tamiya spared no steel in spec'ing the TC's drive shafts. Each one is 6mm thick and has a chunky universal joint at the center gearbox. Thanks to the angled front and rear gearboxes, the TC's center shafts do not need a universal at each end; the shafts slide directly into the gearboxes and drive the diffs directly via bevel pinions.



The Terra Crusher kit includes a fuel bottle, a big tube of thread-lock, air filter oil ... you even get spare drive axles, brake rotors and body posts

INCLUDED ELECTRONICS

- Tamiya AdSpec 2-channel AM transmitter and receiver
- Tamiya TP-3302 110 oz.-in. steering servo
- Tamiya TP-3003 44 oz.-in. throttle/transmission servo

INCLUDED ACCESSORIES

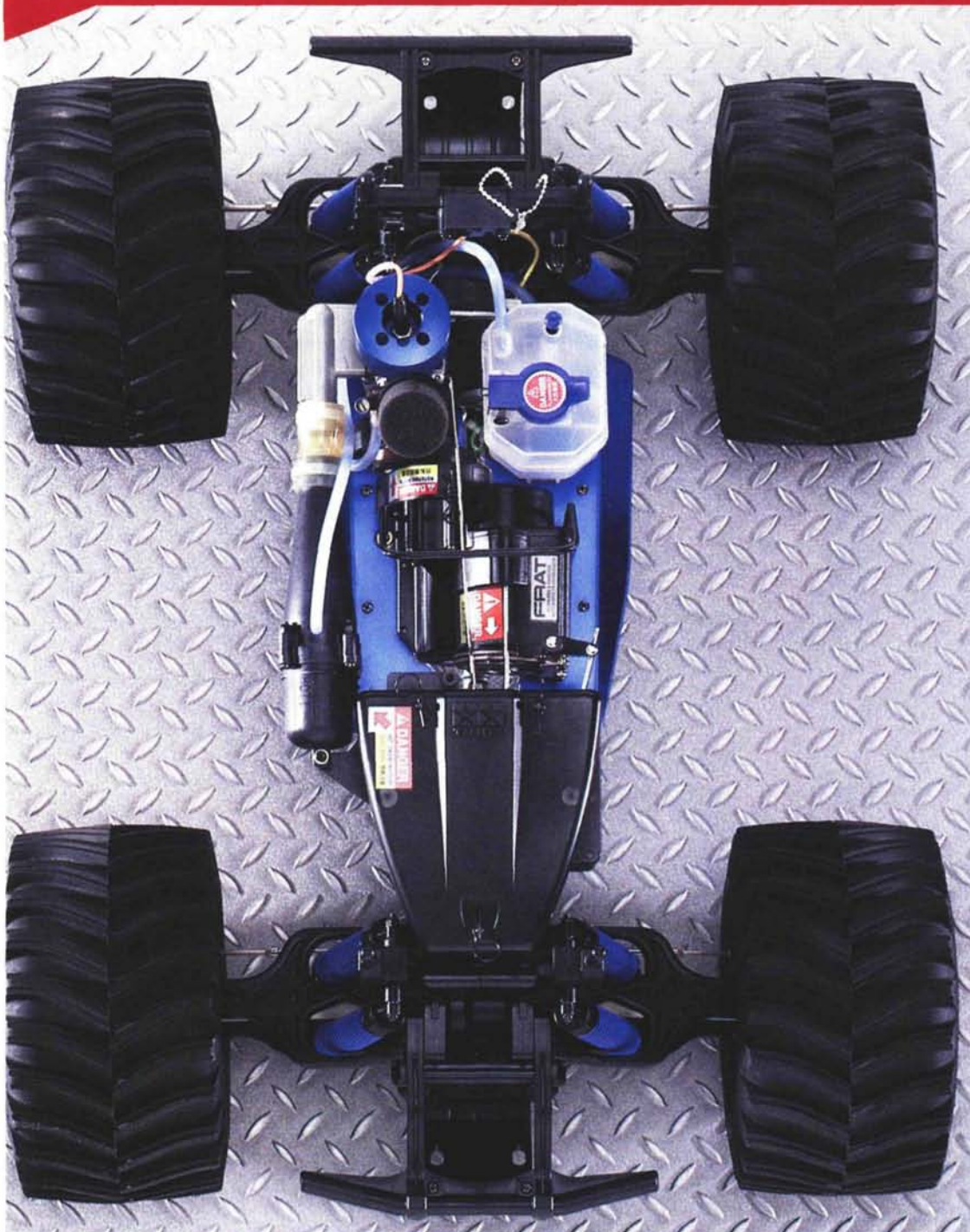
- Tamiya thread-lock
- Ceramic grease
- Air-filter oil
- 4 spare disc rotors
- Spare plastic ball ends
- Spare left and right telescopic axles
- Handheld starter with spare fuse
- Glow-plug wrench
- Fuel bottle

NOT INCLUDED

- 6-cell stick pack (for electric starter)
- Fuel
- 12 AA batteries

SPECIFICATIONS

Length, overall	22.1 in. (560mm)
Height, overall	11.8 in. (299mm)
Wheelbase	14.2 in. (360mm)
Maximum ground clearance	4.62 in. (118mm)
Suspension travel	2.87 in. (73mm)
Weight (RTR)	12.4 lb. (5,604g)
Bearing type	Metal-shielded
Shocks	Coil-over, oil-filled
Suspension	Independent
Arm length	3.87 in. (98mm)
Transmission ratio	29.7:1 (first gear), 20.9:1 (second gear)
Differentials	Gear
Slipper clutch	Dual pad
Engine	.18ci
Axles	Universals
Transmitter	2-channel Tamiya AdSpec
Steering servo/torque (approx.)	Tamiya TP-3302/110 oz.-in.
Throttle servo/torque (approx.)	Tamiya TP-3003/44 oz.-in.



Above: dual plastic-body shocks pass through the upper arms to reach the lowers, and the plastic drive axles are strengthened by aluminum shafts. Below: the oversized dual-rotor brake (arrowed) is just visible on the front of the FRAT transmission.



Above: Tamiya specs a short head for its engine and an unusual multipiece molded pipe. The rollover hoop helps prevent damage and supports the body in a crash. Right: from the underside, the Terra Crusher appears to be all tires. A full set of turnbuckles make toe adjustments easy, and substantial skidplates protect the steel universal-joint center drives.



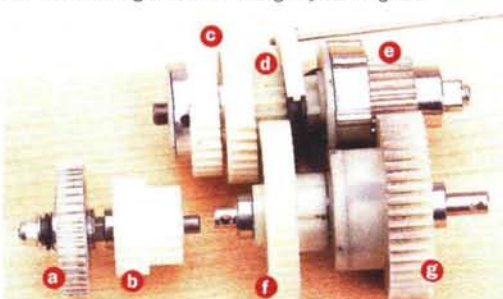


REVERSE ENGINEERING: INSIDE TAMIYA'S FRAT SYSTEM

Tamiya's Forward and Reverse Automatic Transmission (FRAT) is easily the most complex tranny we've ever pulled apart, and it is as ingenious as it is functional. The external spur gear (A) spins an internal, stepped pinion (B) to turn the 2-speed tranny's dual spur gears (C), which turn the top shaft along with the input gears (D and E) that mesh with the forward output gears (F and G). The large housing on gear G encloses a diff that is keyed to gear F (the reason is coming up). When the tranny is shifted into reverse via the linkage on the top shaft, things start to happen. The brake system (not shown), which is attached to the end of gear E, slows the truck and eventually locks gear E. Simultaneously, the shift linkage mechanically disengages the clutch shoes inside the gear-E clutch bell, so the top shaft can still spin. Now, gear F turns the diff inside gear G, and this reverses the output shaft to move the Terra Crusher backward.



It's tough to wrap your head around the idea, but it's just like the diff in a 2WD car; if you hold the diff gear and turn the right wheel, the left wheel turns in the opposite direction. That's the principle the FRAT gearbox is built on, and that's what allows the transmission to shift from forward to reverse without meshing and un-meshing any of the gears.



DRIVING THE TERRA CRUSHER

Starting the Terra Crusher was as quick and easy as electric starting should be; we had only to plug in the starter unit and hit the "start" button, and the engine burbled to life. After breaking in the engine and adjusting the single-needle carburetor for best performance, we made a few radar runs to get a top speed into the books. With a best run of 27.4mph and average speeds of 26- to 27mph, the Terra Crusher is as fast as other nitro monsters. The 2-speed tranny shifted very smoothly, and acceleration was relatively crisp for such a large-wheeled, heavy machine. At speed, the Terra Crusher hit the three-wheel motion when cornering but was otherwise sure-footed.

Jumping the TC was a no-brainer; all we had to do was line it up and pull the trigger. The truck's in-air attitude was neutral; there was no need to grab the brakes or blip the throttle to level out. Landing impacts were easily absorbed by the supple suspension without a hint of rebound, and off-camber touchdowns barely knocked the big machine off its intended course. Not surprisingly, the suspension was very adept at eating up bumps; the TC's long arms pumped up and down with impressive quickness, given the heavy tires at their ends, and kept the chassis stable as we plowed the truck through rough stuff at speed.

Climbing was also easy for the TC, but at times, we wished it could shift on the fly; for the really steep stuff, the TC would have fared better if it had stayed in first gear. But traction was never an issue, and the edgy Tamiya chevrons dug in like backhoes.

It's likely that many Terra Crusher owners will hit the T-Maxx class at their local track, so we put the TC through its race paces. The truck has a lot of steering, due in large part to its included heavy-duty steering servo. It will lift its inside front wheel in hard corners and widen its line, but it does so predictably and responds well to brake-and-turn cornering.

And reverse? Tamiya has the best system yet. You can jam the TC into "R" while driving at full speed, and the tranny doesn't even hiccup. The truck slows and then digs in and reverses—without a pop, grind, or snap. And since the 2-speed shifts in forward and reverse, you can parallel-park at nearly 30mph, if you really want to.

RATING THE TERRA CRUSHER

Congratulations, Tamiya; you just might have the best small-block monster truck yet. With seemingly endless suspension travel, an easy-to-start goof-proof engine, rugged good looks and bigger dimensions than the competition, the Terra Crusher is a must-drive for anyone in the nitro-monster market. Factor in an exceptional RTR package with lots of spare parts, a beautifully sculpted and finished body, high-quality radio gear and a reverse-with-brake system that is far superior to anything else offered previously, and you have a truck that scores highly in performance, features, convenience and fun. ■

SOURCE GUIDE

KYOSHO distributed by Great Planes Model Distributors (800) 682-8948; www.kyosho.com.

SIDEWINDER FUELS distributed by Morgan Fuel, (800) 633-7556; www.morganfuel.com.

TAMIYA AMERICA INC. (800) 826-4922; www.tamiyausa.com.

SPONSORED BY

KYOSHO
THE FINEST RADIO CONTROL MODELS

BY GREG VOGEL



Jukka moving to the U.S.

European and U.S. championship-winning driver Jukka Stenari will move to the U.S. and stay for approximately one year on a school visa. He'll work in Losi's R&D department and will attend as many U.S. races as he can.

Ryan Cavaleri joins Orion

For the 2002 season, pro driver Ryan Cavaleri has moved to the Orion camp and will now use Orion nitro and electric power in his race cars.



BOARD WALK

FROM THE
RADIOCONTROLZONE
.COM BULLETIN BOARD

Regional Forum > Central Maryland

SABIAN: Does anyone know of any off-road tracks that race stock class in the southern Maryland area? SOMR didn't run electrics last year, and the closest I found was all the way in Dumfries, VA.

RCJON: There are only three tracks in Maryland: Aarons, Marks and Waldof, but I don't think Waldof runs electric.

Nitro Forum > 1/8-scale buggy showdown

REDSMURPHAT: How do you guys/gals think the GS Racing Storm Pro would have done in the RC Car Action shootout if had it been included?

YZ167: Mugen was a close second to first. I believe the GS would have battled with the Thunder Tiger and the OFNA for the third spot.

Vehicle Forums > Team Losi Triple-XT Forum

TARVYMOTO: Can you comment a bit about a rear spindle that has a vertically mounted ball stud? How does raising or lowering the ball stud affect the roll center and performance?

LOSIFREAKZOM: Raising the ball stud will create less camber change through the suspension movement. This raises the roll center. In a nutshell, the car will have less side-bite. Also, as the car accelerates, the rear tires will stay flat on the ground, giving you more forward bite.

BE HEARD!
LOG ON AT WWW.
RADIOCONTROLZONE.COM



Kinwald's body for sale

All right sickos, we're talking about his Losi Triple-XT race truck body. After Brian threw away one of his thrashed truck bodies at a race last year, a fan retrieved it from the trash and asked him to sign it. Brian whipped out the Sharpie and turned the used-up Lexan into an instant collectible. But it looks like the fan had a cash crunch: the body turned up for sale on eBay and sold for \$152.99!

RC PRO SERIES

Richard Saxton, Bill Jackson and Mike Battaille have created a new RC race series—the RC Pro Series. They intend to increase the public's/enthusiasts' exposure to RC racing and to develop a professional racing series.

RC Pro will be held yearly at different off-road tracks across the USA. Each year, RC Pro will select a group of the best tracks. They intend to hold three races in the Eastern U.S. and three in the West, and the final race will then be held in a centrally located track. Racers will earn the right to compete in the final by doing well in the East or West series.

This may become one of the most exciting RC series events for the professional racers who compete in them and for the spectators who want to see the very best in off-road racing.

2002 RC PRO RACING SEASON

West	Race 1	March 6 to 10	Las Vegas, NV
East	Race 1	April 3 to 7	Miami, FL
West	Race 2	May 1 to 5	TBA
East	Race 2	June 5 to 9	Aiken, SC
West	Race 3	July 3 to 7	Burbank, CA
East	Race 3	July 31 to August 4	Pleasant Hill, MO
FINAL		September 11 to 15	Oklahoma City, OK

SITE SEEING



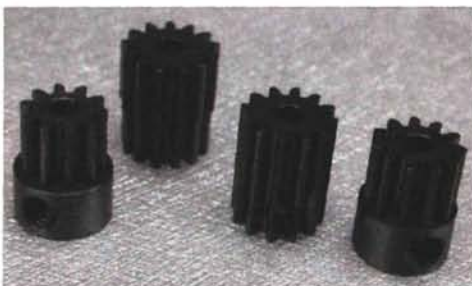
www.autobuzz.com

Ever find yourself staring at the wall trying to come up with a cool racing paint job? To get those creative juices flowing, you might want to check out this website. It's loaded with full-scale import show cars with crazy paint schemes that might inspire you for your next paint job.

RUMOR MILL

TEAM LOSI TRIPLE-XT RTR. Could it happen? Maybe. A lot of the required parts already exist in the Triple-XT Sport (tested this issue), so it's not hard to see Losi taking its high-performance RTR concept to electrics. ■ **HIS BOYS CAN SWIM.** Pro-Line tire guy/Associated driver Mark Pavidis is the proud papa of a new baby boy. "If I were any more fertile, you could grow a lawn on me" says Mark. ■ **NITRO TC3 RTR?** No official word from the A-Team, but we think you can count on seeing a pull-start Associated .15-powered NTC3 in the near future.

SPEED SHOP



HPI Micro RS4 steel pinions

Pinion gears offer the quickest, least expensive way to get a little more speed out of your Micro RS4 or any other car. HPI offers long-lasting precision steel pinions designed specifically for the Micro; they range from a 9-tooth to a 13-tooth, and each gear comes with a setscrew.

Item no. 72481 (9T), 72482 (10T), 72483 (11T), 72484 (12T), 72485 (13T); \$4.

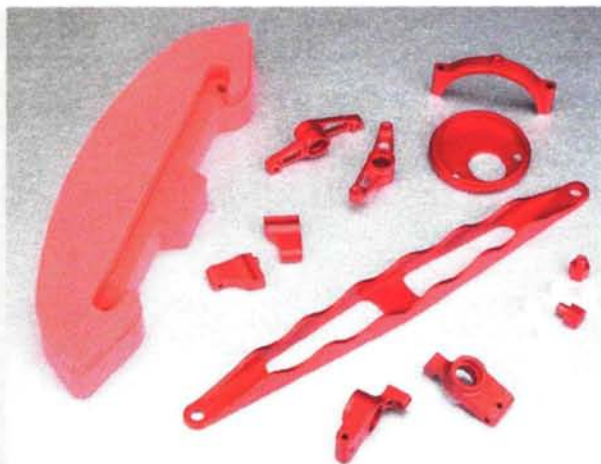
HPI Racing (949) 753-1099; www.hpiracing.com.

TRINITY More Matt Francis Triple-XS parts

Last month, we featured Triple-XS suspension parts from Trinity's Matt Francis line. This month, we show off the rest of the collection. Like all the Matt Francis parts, the steering bellcranks, battery strap, motor plate, motor-mount clamp, rear hubs and servo mounts are precision-machined from strong aluminum and anodized bright red. The shock pivots are also aluminum, but they feature Delrin balls, so the shocks pivot smoothly. The red foam bumper is a double-deck style, so you can use it as you use the stock bumper or with Trinity's Kydex bumper brace.

Item no. TMF1100 (foam bumper), \$6.50; TMF1116 (shock bushings), \$7.99; TMF1112 (servo mounts), \$22.99; TMF1102 (battery strap), \$24.99; TMF1120 (motor plate), \$17.99; TMF1104 (motor clamp), \$22.99; TMF1115 (rear hubs), \$37.99; TMF1119 (bellcranks), \$39.99.

Trinity Products Inc. (732) 635-1600; www.teamtrinity.com.



SPEED TECH RC Triple-XS parts

If you want to make your Triple-XS a little cooler, lighter and more precise, check out these parts from Speed Tech RC. The Triple-XS's stock composite towers look great, but front and rear 3mm-thick carbon-fiber towers look even better and are very strong. Speed Tech's aluminum steering bellcranks and lower suspension blocks help reduce slop for more precise steering and handling.

Item no. STXXXSF (front tower), \$12.99; STXXXSR (rear tower), \$15.99; ST1540 (bellcranks), \$25.99; ST1230-59 (front inner pivot), \$19.99; ST2230-91 (rear inner mount), \$19.99.

Speed Tech RC (909) 869-7443; www.speedtechrc.com.



CORALLY Traction additives

Here's a way to get into a sticky situation. Corally offers several traction additives to get your car hooked up. TC-1 Tire Traction (green can) was formulated specifically for carpet tracks; TC-2 "Jack the Gripper" (purple can) is popular and offers excellent traction—without the nasty odor—for both foam and rubber-compound tires; TC-3 (blue can) traction compound is an all-around additive that helps improve grip on just about any surface.

Item no. 13788 (TC-1), 13779 (TC-2), 13789 (TC-3); \$9.98/can.

Corally; distributed by Specialized RC Intl. (407) 681-5905; www.corallyusa.com.

SCHUMACHER Mission alloy diff mounts

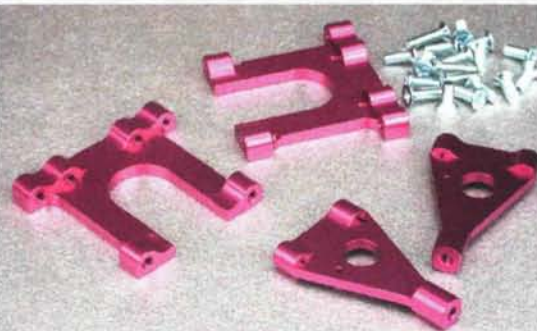
When you've bolted in a powerful motor, the last thing you want is for the drive train to flex or move, as that robs you of power. For Mission owners, aluminum upgrades such as these alloy diff mounts and this layshaft mount will make certain that power goes where it belongs—to the ground.

The mounts are purple-anodized, precision-machined direct replacements and include installation hardware. One package includes both left and right mounts, but to replace the mounts in the front and the rear, you'll need to order two packages.

Item no. U2462X (diff mounts); \$28.99;

U2463Y (layshaft mounts); \$19.99.

Schumacher USA (813) 889-9691; www.racing-cars.com.



TRACK THREADS

TREADZ Jacket

Here's something cool for cold-weather racers. It's a thick, warm hoodie jacket with the Treadz logo embroidered on the front and back; available in large (L) to XXL, it has pockets almost big enough to fit your pistol ... grip radio.

Item no.

TZJACKETL,

TZJACKETXL,

TZJACKET

(L, XL, XXL);

\$100.

Treadz; distributed

exclusively by HRP

(801) 978-9500;

www.treadztires.com.



UNDER THE HOOD

David Spashett Team Losi Triple-XS

EQUIPMENT USED

Radio system: KO Propo Vantage (stick radio)

Steering servo: KO Propo 2173

ESC: LRP Quantum

Motor: Trinity P94 8x2

Gearing (pinion/spur): 26/128

Tires (F/R): TRC plaid/TRC purple

Rims: TRC Aero Wheels

Body: Protoform Stratus

SETUP

	FRONT	REAR
Caster/squat	6°	0°
Camber	-2°	-1.5°
Toe-in/-out	0°	1.5°
Ride height (mm)	3.5	4
Swaybar	0.078	

SHOCKS

	FRONT	REAR
fluid	50WT	60WT
piston	60	55
spring	Black	Black
mounting location (shock tower)	3	3
camber-rod location (hub/bulkhead)	Std3	1B

FACTORY OPTIONS

- Trinity Matt Francis lowered suspension blocks
- Trinity Blue turnbuckle set
- Losi 6° caster blocks
- Losi 0.5° hubs installed backward to reduce rear toe to 1.5°
- Losi graphite chassis
- Losi graphite A-arms
- Losi graphite caster blocks and rear-toe-in blocks
- Losi front universals
- Losi short shock shafts and body

MODIFICATIONS

- Front roll bar
- Body lowered to 4 3/8 in.

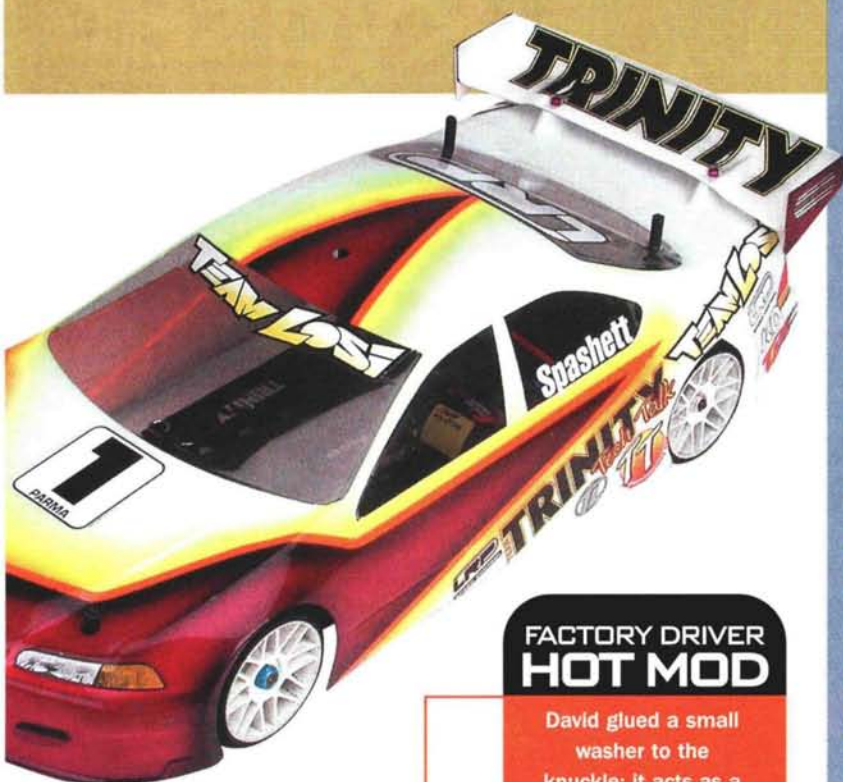


1. David's car rolled into tech underweight, so he was able to further tune his Triple-XS with some lead weight; notice the lead in the steering tunnel.



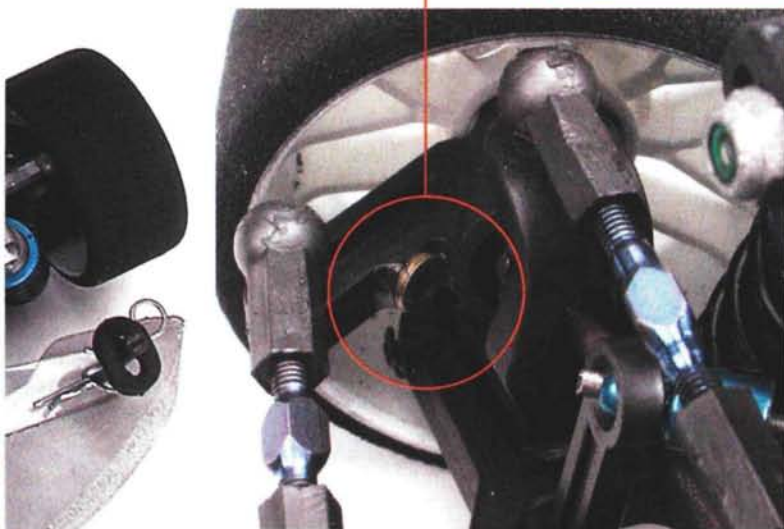
2. The front of Spashett's ride looks like a Triple-XS, but this one is equipped with all the graphite goodies. We did notice that he shimmed up the steering ball end with a plastic spacer.

3. The pro's take no chance when the title of a big race is at stake. A dot of CA on the pin-retaining setscrew prevents it from working its way out during a race. On the inside of the arm, you'll notice that David uses sma spacers to fine-tune the camber.



FACTORY DRIVER HOT MOD

David glued a small washer to the knuckle; it acts as a steering stop.



5 QUESTIONS

DRIVER: David Spashett
AGE: 25
SPONSORS: Trinity, Team Losi, LRP, KO Propo, TRC
LAST BIG WIN: Cleveland TC
FAVORITE SAYING: "Pint please!"



WHEN I'M NOT RACING, I try to spend as much time with my girlfriend and friends as possible. I like to play basketball, and when I have time, I go to the gym—not that it does me any good. Then, the usual stuff: films, pubs, clubs and listening to music.

RC CAR ACTION: When it comes to on-road racing, you are The Man. Were you always an on-road racer, or did you start elsewhere?

DS: Not sure about being "The Man," but yes, I have always been an on-road racer. I have tried off-road with varied success, but my true love is on-road.

RCCA: Where would you say racing is more competitive—in Europe or in the U.S.?

DS: There are a lot more world-class drivers in America than in Europe, but even so, to win a race anywhere in the world is still hard; there are no easy races. I just love the competition wherever it is.

RCCA: What is your most memorable race moment?

DS: Passing Masami Hirotsuka on the outside down the main straight in the third final of a Worlds championship race for the second time! That has to be the most memorable moment.

RCCA: You've been behind the wheel of the Triple-XS for quite some time. What do you feel are the car's strengths and weaknesses?

DS: I really do like everything about the car. The drive system really suits our long tracks in Europe, and yet it still provides enough rip to be competitive on smaller, tighter tracks. The chassis is incredibly stiff, so it's an excellent platform to work from. The layout makes everything easy to work on and adjust. But what makes the car better for me is still the way the shock towers are mounted on the spine of the chassis; this makes it very hard to twist or tweak the car. This then allows you to work more on setup than on fixing problems.

RCCA: You're British. If you had to live the rest of your life with one Spice Girl, which one would you have picked?

DS: Geri, AKA Ginger Spice.

LAST LAP

If you could be any pro driver, who would you be and why?

The one and only Squirrel (Scott Hughes), simply because he's known for being a nut and so am I! Plus, he's a good driver.
Randy Hynd

I would be Masami Hirotsuka, not only because his skills translate to almost any form of RC racing but also because he has been in the business for years and has seen the hobby grow and evolve.
Cameron Wallace

I would be Billy Easton because he races at my local track here in Irvine (SoCal R/C Raceway), and he helps me with my TC3

whenever I have a problem. It would be really cool to do the same thing for another kid who has problems with his car as I've had.
Mac Dalton

That is an easy one—Matt Francis. He's an awesome truck and 4WD buggy driver, and those are my favorite off-road categories.
Matt Melchart

I would be Billy Easton because he is a great driver in just about any racing category. Billy is just awesome I hope he keeps driving as well as he does.
Kyle Cermak

NEXT MONTH'S QUESTION

Are you in favor of a 10-turn motor limit for modified racing? Should motors be limited to an even lower wind—or should there be no limits at all?

Respond by clicking "Last Lap" at www.rccaraction.com.

U.S. TRIPLE CROWN

The third leg of the Triple Crown landed in Enfield, CT. All the big names were there trying to gain valuable points in the five-race series (best three finishes count for final standings). RC Madness and crew expanded the pit area, and they even had two plasma-screen TVs on the walls, so everyone could keep an eye on the action.



PAUL LEMIEUX WORKS HIS JEDI MIND TRICK. "THIS CAR WILL GO FAST."

FOX TELEVISION NETWORK'S "KIDS SPORTS" WAS ON HAND TO TAPE THE ACTION AND INTERVIEW THE DRIVERS. GARRY BAKER CALLED FOR MAKE UP BEFORE GOING ON CAMERA. I THINK HE USED THE WRONG COLOR.



Josh Cyrul was the top dog in the 1/12-scale Mods.



In the 1/12-scale Stock A-main, Mark Smyka took first place.



Paul Lemieux took the win in the Sedan Modified A-main.

The Pan Sedan action ended with Jay Livingstone as the winner.



Mark Adams claimed first in the Sedan Stock.



In the 1/12-scale Masters A-main, Chuck Loneragan crossed the finish line first. ■

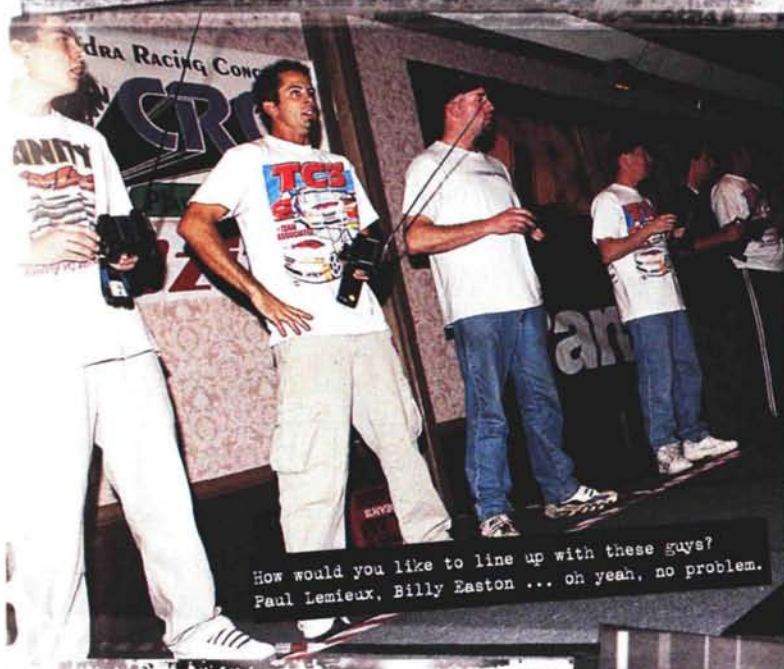


CLEVELAND INDOOR

Team Trinity Takes the Gold



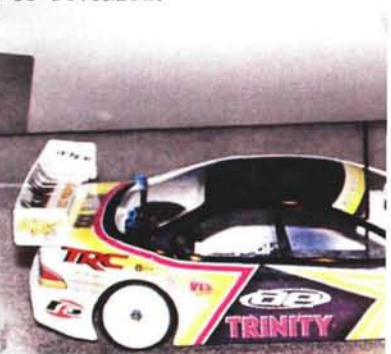
SETUP AND TEARDOWN OF THE TRACK INSIDE THE HOLIDAY INN BALLROOM WAS AN ENORMOUS TASK. HATS OFF TO THE TRACK CREW FOR THEIR HARD WORK.



How would you like to line up with these guys?
Paul Lemieux, Billy Easton ... oh yeah, no problem.

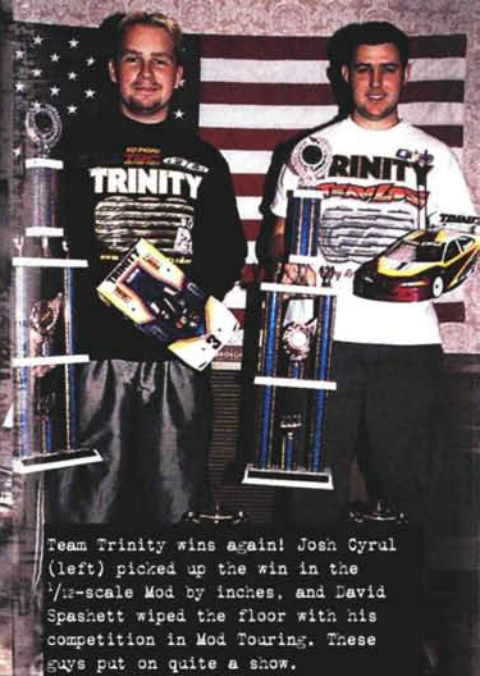
While many of you enjoyed a four-course turkey dinner over last year's Thanksgiving holiday weekend, hundreds of dedicated 1/12-scale and touring car racers wrunched on their cars and prepared for one of the oldest racing events in RC. The 2001 Cleveland Indoor Championships (in Ohio) marked the 22nd year that this unique event has been held. What's so unique about it? The Indoor Champs is the only race where the track is inside a hotel conference room, and the racers pit right in their hotel rooms. The event schedule is broadcast over one of the hotel's TV channels, so the racers know when it's their turn to race. Cool!

More than 460 drivers attended the Indoor Champs in 2001, including some of the biggest names in RC. As you can imagine, the racing action was intense, and surprises were around every corner. Fortunately, we were there to catch the action, so you were able to enjoy the Thanksgiving festivities without booking a flight to Cleveland on the busiest weekend of the year. If you're wondering how the event went down, read on; all will be revealed.

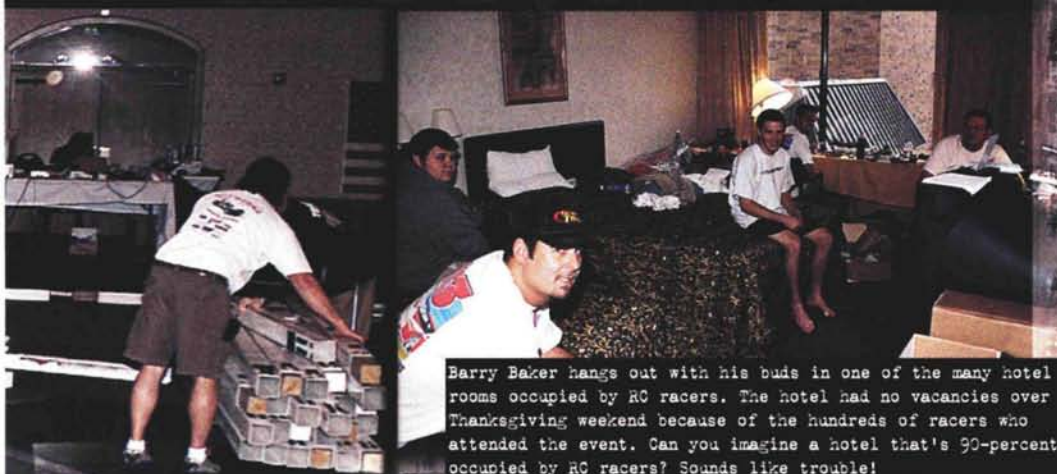


CHAMPIONSHIPS

by George M. Gonzalez



Team Trinity wins again! Josh Cyrul (left) picked up the win in the 1/12-scale Mod by inches, and David Spashett wiped the floor with his competition in Mod Touring. These guys put on quite a show.



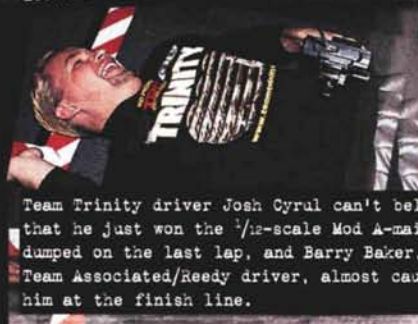
Barry Baker hangs out with his buds in one of the many hotel rooms occupied by RC racers. The hotel had no vacancies over Thanksgiving weekend because of the hundreds of racers who attended the event. Can you imagine a hotel that's 90-percent occupied by RC racers? Sounds like trouble!



Vicky Blackstock: hands-down the fastest woman in RC. That isn't surprising considering that she's married to Team Associated/Reedy factory driver Mike Blackstock. Although it isn't obvious in the photo, Vicky is expecting a baby. Who knows?—maybe the pair will be the proud parents of a future world champion driver.



Team Trinity/Team Losi factory driver and mod touring champ David Spashett takes a breather from working on his cars. His hotel room looks like my garage.



Team Trinity driver Josh Cyrul can't believe that he just won the 1/12-scale Mod A-main. He dumped on the last lap, and Barry Baker, the Team Associated/Reedy driver, almost caught him at the finish line.



Team Trinity/Team Losi driver Paul Lemieux preps his Losi Triple-XS for the Main.



Frank Calandra Jr. crossed the line first in the 1/12-scale Masters. Just in case you don't know, Frank owns CRC. The blood-red-anodized motor pod on his CRC Carpet Knife was a standout at the track.



Trinity motor-builder Jim Dieter preps armatures for his drivers. This guy is dedicated to his team.

Wayne Vince traveled all the way from Ontario, Canada, to take the win in Stock Touring. His SMC and Fantom-powered Associated TC3 was dialed!



A-MAIN ACTION

Stock Touring

Top qualifier Jeff Durling got a bad start and adopted the caboose position behind the freight train of Scott Smither, Wayne Vince and Dana Bailes. After the first couple of corners, Bailes had worked up a good lead, but a battle for second between Vince, Smither and Durling was in full force. Bailes's lead continued into the first 3 minutes of the race, but after four super-fast 10.9-second laps in a row, Durling was back in second and had his sights set on the leader.

The last couple of minutes brought many surprises. The leader, Bailes, clipped a board as he went through the chicane, and he dropped to fourth. This left Durling in the lead, but with Vince and Mark Adams—who had been flanking the leaders all along—riding his tail. On the next lap, Vince made a successful move on Durling and with only seconds remaining on the clock, he found nothing but open real estate in front of his car. Vince took home the first-place trophy, while Durling and Adams had to settle for second and third, respectively.

Mod Touring

This was the event everyone had waited for, as evidenced by the huge turnout of spectators who jammed the compact ballroom track area. Team Trinity driver David Spashett sat on the pole position with his teammate Josh Cyrul right behind in the second qualifying position. At the sound of

the tone, 10 cars funneled into the first corner led by Spashett and Cyrul, followed by Mike Lufaso and Team Associated/Reedy driver Barry Baker. A shuffle in the second lap put Baker in second and Cyrul in third, but Cyrul regained his position on the next lap and didn't give it up again.

Spashett had an enormous lead and laid down some incredibly fast lap times; just when it seemed he couldn't go any faster, Spashett would better his previous lap time. His Trinity-powered Losi Triple-XS was on rails! Spashett and Cyrul kept up the pace, while Baker and Lufaso battled it out for third. At the tone, Spashett's car flew past the finish line to claim the victory, and Cyrul's car rolled in a few tenths of a second later to claim second. Lufaso and Baker took third and fourth, respectively.

1/12-scale Mod

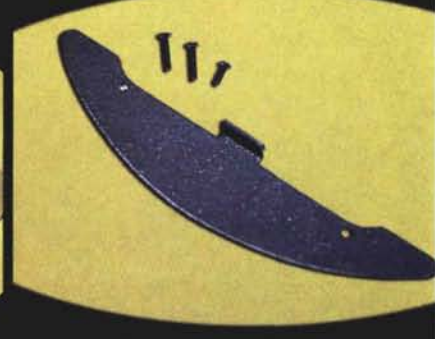
Some of the best drivers in the world were represented in this class, but you wouldn't have known it from the carnage at the first corner. After a terrible start, top-qualifier David Spashett found himself in sixth with a tweaked chassis. Barry Baker got through the pileup without a scratch, and he assumed the lead in front of Team Associated/Reedy driver Mike Blackstock and Josh Cyrul, who inherited second and third.

It was obvious that Josh Cyrul was on a mission because by the fourth lap, he was back in second and all over Baker's tail. By lap 10, Cyrul was in the lead after getting around Baker with an exhibition of raw power down the back straightaway. Cyrul now had control of the race, but that single

NEW IN THE PITS

Niftech

Here are just a few of the many new products Niftech displayed at the Indoor Champs. The new TC3 hollow titanium drive shaft (item no. 1035-T) resists twisting caused by torque to provide instantaneous acceleration. Niftech's Precision Swiveling flat drive-pin assembly (2350-SWD) replaces the round drive pin found on MIP CVD axles with a hardened-steel flat drive pin that resists notching the outdrive slots—perfect when using light aluminum or plastic outdrives. Niftech's Pin Extraction and Insertion Anvil Stand for 3/32-inch pins (2321-062-ANVIL) has all the tools to make installing and removing the swiveling flat pins easy. Also shown is Niftech's unique graphite RC12L3 axle (1024). Both ends are threaded, so you can use the stock left-side hub, if you want to; it is also designed for use with the new 3-spoke wheels. The diff plate is machined from 7075 aluminum and includes Niftech's thrust-sleeve assembly, ground flat setscrew and bearing savers. Niftech (440) 257-6018; www.niftech.com.



BRP

BRP's new Losi Wide Triple-XS bumper (6226) is made of Kydex for extra strength, and it is much wider to enhance front suspension protection. It is simple to install and all the necessary hardware is included. The Bud's TC3 battery-retaining system (6237) is made of dyed-blue fiberglass. The battery strap includes a rigid foam spacer and side foam padding that eliminates side play when a battery pack is installed. BRP Inc. (440) 284-0270; www.brpracing.com.



Parma/ PSE

Several drivers, including 1/12-scale Mod champ, Josh Cyrul, used Parma's new 2001 EXP Speed 8 body (10125-0.030 Lexan; 10125L-0.020 Lexan). It features a slammed cockpit that seems to wrap around the chassis and has a huge rear wing. This body is supposed to provide good turn-in with equal balance and plant the car better in the corners.

Parma/PSE (440) 237-8650; www.parmapse.com.

2001 CLEVELAND INDOOR CHAMPIONSHIPS' RESULTS

	FIN.	QUAL.	DRIVER	CHASSIS	BATTERY	ESC	RADIO	TIRES
STOCK TOURING	1	4	Wayne Vince	Associated TC3	SMC Sanyo 3000	Novak	JR Racing R1	TRC
	2	1	Jeff Durling	Associated TC3	O'Tech	Novak	Airtronics	TRC
	3	10	Mark Adams	Associated TC3	Power Push	Novak	Airtronics M8	n/s
	4	3	Dana Baker	Team Losi Triple-XS	Panasonic 3000	GM	Airtronics	TRC
	5	6	Dave Johnson	Associated TC3	n/s	Novak	Airtronics	Jaco
	6	8	Chuck Lonergan	Associated TC3	SMC Sanyo HV	Novak	Futaba	Jaco
	7	7	Scott Smither	Associated TC3	SMC 3000 HV	Novak	KO Propo	Jaco
	8	5	Craig Kester	Losi Triple-XS	Trinity	Novak	Airtronics	TRC
	9	8	Aaron Buran	Associated TC3	Power Push	Novak	Airtronics M8	Jaco
	10	2	Mike Dunnigan	Associated TC3	SMC	Novak	Airtronics	Jaco
MOD TOURING	1	1	David Spashett	Team Losi Triple-XS	Trinity VIS NIMH	LRP	KO Propo	TRC
	2	2	Josh Cyril	Associated FT TC3	Trinity 3000 SMH	LRP	KO Propo	TRC
	3	4	Michael Lufaso	Associated FT TC3	Reedy 3000 R3K	LRP	n/s	Jaco
	4	3	Barry Baker	Associated FT TC3	Reedy 3000 R3K	LRP	Airtronics	Jaco
	5	7	Paul Lemieux	Team Losi Triple-XS	Trinity 3000 SMH	n/s	n/s	TRC
	6	9	Walter Henderson	Associated TC3	Reedy 3000 R3K	LRP	Airtronics M8	Jaco
	7	5	Mike Blackstock	Associated FT TC3	Reedy 3000 R3K	Novak	KO Propo	Jaco
	8	6	Jon Orr	Associated FT TC3	Reedy	LRP	KO Propo	Jaco
	9	10	Eric Desrosiers	Associated TC3	Reedy	Novak	n/s	Jaco
	10	8	Jeff Brown	Associated TC3	Reedy	Novak	Futaba 3P4	Jaco
1/2-SCALE MOD	1	3	Josh Cyril	Trinity Switchblade 12	Trinity 3000 SMH	LRP	KO Propo	TRC
	2	2	Barry Baker	Associated RC12L3	Reedy 3000 R3K	LRP	Airtronics M8	Jaco
	3	7	Mike Lufaso	Associated RC12L3	Reedy 3000 R3K	LRP	n/s	Jaco
	4	9	Mike McMahon	CRC 6-Pack	SMC 3000 Sanyo	Keyence	KO Propo	Jaco
	5	4	Jon Orr	Associated RC12L3	Reedy	LRP	KO Propo	Jaco
	6	10	Eric Desrosiers	Speed Merchant	Reedy	Novak	n/s	Jaco
	7	1	David Spashett	Trinity Switchblade	Trinity VIS NIMH	LRP	KO Propo	TRC
	8	6	Paul Lemieux	Trinity Switchblade	Trinity 3000 SMH	n/s	n/s	TRC
	9	8	Walter Henderson	Associated RC12L3	Reedy 3000 HV	LRP	Airtronics M8	Jaco
	10	5	Mike Blackstock	Associated RC12L3	Reedy 3000 HV	Novak	KO Propo	Jaco
1/2-SCALE STOCK	1	3	Scott Smither	CRC 6-Pack	SMC Sanyo 3000	Novak	KO Propo	Jaco
	2	7	Mark Adams	Speed Merchant	Power Push 3000	Novak	Airtronics M8	n/s
	3	5	Jeff Durling	Associated	O'Tech	Novak	Airtronics	Jaco
	4	2	Mike Dunnigan	Associated RC12L3	SMC	Keyence	Airtronics	Jaco
	5	1	Wayne Vince	CRC Carpet Knife	SMC Sanyo 3000	Novak	JR Racing R1	TRC
	6	10	Booby Fleck	Associated RC12L3	Power Push	Novak	KO Propo	Jaco
	7	9	Dan Miles	n/s	O'Tech	LRP	KO Propo	Jaco
	8	6	Vicky Blackstock	Associated RC12L3	Power Push 3000 HV	Novak	JR Racing	TRC
	9	4	Jay Robinette	Pro Parts JR	Stevos	Novak	JR Racing	TRC/Jaco
	10	8	Dana Baker	CRC Carpet Knife	Panasonic 3000	GM	Airtronics	Jaco
1/2-SCALE MASTERS	1	2	Frank Calandra Jr.	CRC Carpet Knife	World Class 3000	Novak	JR Racing R1	Jaco
	2	1	Paul Martin	Trinity Switchblade	Power Push 3000	GM	JR Racing R1	Jaco
	3	5	Eli Exrow	Speed Merchant	SMC 3000 HV	Novak	JR Racing R1	Jaco
	4	3	Bob Van Wagner	CRC 6-Pack	World Class 3000	Novak	JR Racing R1	TRC
	5	4	Chuck Lonergan	Trinity Switchblade	SMC 3000 HV	Novak	Futaba	Jaco
	6	9	Jerry Cyril	Trinity Switchblade	Trinity 3000 SMH	KO Propo	Airtronics	TRC
	7	8	David Lee	Speed Merchant	SMC Sanyo 3000	LRP	Airtronics	TRC
	8	10	Mark Sweetney	Speed Merchant	World Class	n/s	KO Propo	n/s
	9	7	Junior Norton	CRC-Pack	Power Push	GM	Futaba	Jaco
	10	6	Tom Esposito	Trinity Switchblade	Trinity 3000	Novak	JR Racing R1	TRC

n/s Driver did not supply information

burst of speed haunted him in the final seconds; Cyrul's car slowed as his batteries began to go flat. Baker had gotten into trouble as he worked his way through traffic, and that gave Cyrul a little breathing room, but on the final lap, Baker made it through the pack and had Cyrul in his sights.

During the final lap the announcer couldn't be heard over the screaming crowd. Cyrul's car had slowed to a crawl, but the finish line was only 30 feet away. Baker flew around the last corner; in the straightaway, he buried the throttle trigger in an attempt to catch the leader. Cyrul's car, however, had just enough juice left to roll over the finish line and claim the victory. Baker rocketed past the line to claim second; it appeared that Baker had enough battery power left to complete one more lap. Mike Lufaso rolled in shortly afterward to claim third. After the race, Cyrul nearly passed out because of the pressure. Now, that's what I call racing!

1/2-scale Stock

After a rocky start, Dana Bailes led the way around the first lap with Scott Smither and Mark Adams glued to his tail. Halfway around the track, the top three cars tangled, and Bailes was out of the race with a broken car. This left Smither in the lead with Wayne Vince in second and Adams in third. Smither developed a huge lead, and Vince and Adams battled for second for several laps until Adams put on the pressure and passed Vince to regain the spot way behind the leader.

Smither wasn't challenged for the duration of the race, although Adams was close enough to take advantage of any mistakes. First and second place were sewn up, but there was a battle for third among Vince, Jeff Durling and Mike Dunnigan. At the tone, Smither crossed the line first to take the championship, and Adams rolled in 3 seconds later to claim second, with Durling third.

1/2-scale Masters

After one of the cleanest starts of the weekend, top qualifiers Paul Martin, Frank Calandra Jr. and Eli Ezrow formed a train and led the pack around the course. On the seventh lap, Calandra made a beautiful pass on Martin to take the lead and then waved goodbye to his competitors. Calandra was gone, but his CRC Carpet Knife was easy to spot because of its blood-red-anodized motor pod. Martin held on to second place and closely pursued Calandra around every corner.

Calandra managed to keep Martin at bay for the duration of the race, but on the final lap Martin's Trinity Switchblade was less than a car's length behind the leader, and the cars crossed the line almost simultaneously. The lap-counting system clearly saw Calandra as the winner and Martin as second. Ezrow claimed third, but it didn't come easy because he had been challenged by Bob Van Wagner and Chuck Lonergan during the entire race.

FINAL THOUGHTS

The 2001 Cleveland Indoor Championships was an awesome racing spectacle and one of the biggest races I have ever attended. The racers put on a first-class exhibition for the hundreds of spectators who dropped in to watch the action.

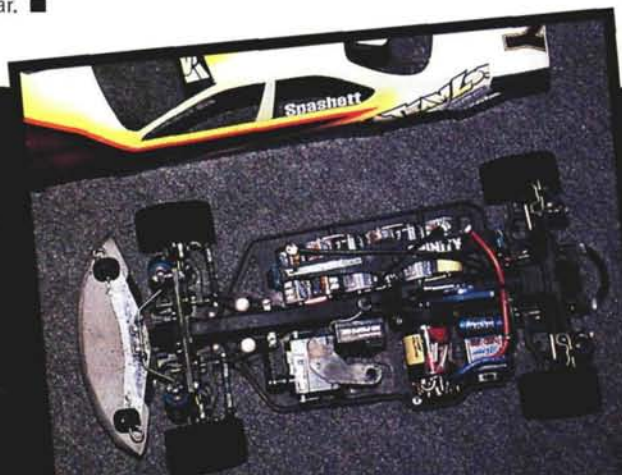
The concept of holding a race inside a hotel and pitting from the privacy of your own room is great. This is one of the longest-running races in RC, and it's easy to understand why it has remained so popular.

Congratulations to the new champs, and thanks to the track crew for putting together an awesome racecourse. A big thanks to Trinity—the event's major sponsor—for its generous support. Hope to see you all there next year. ■

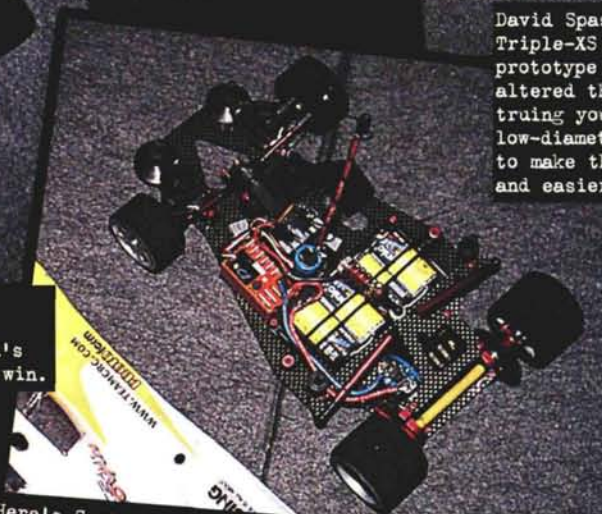
WINNING CARS



Josh Cyrul's 1/2-scale Mod-class-winning Trinity Switchblade 12. The car looks pimped out, but it's mostly stock. Parma's new Speed 8 body helped him capture the win.



David Spashett's Mod Touring class-winning Triple-XS was mostly stock, but I spotted prototype rear-suspension arm mounts that altered the car's rear squat. Talk about truing your tires down to the rim! The low-diameter tires allowed higher gearing to make the car faster on the straights and easier to drive through the twisties.



Here's Scott Smither's 1/2-scale stock class-winning CRC 6-Pack. CRC cars were very popular at the Indoor Champs.



Mount Bodies the Right Way

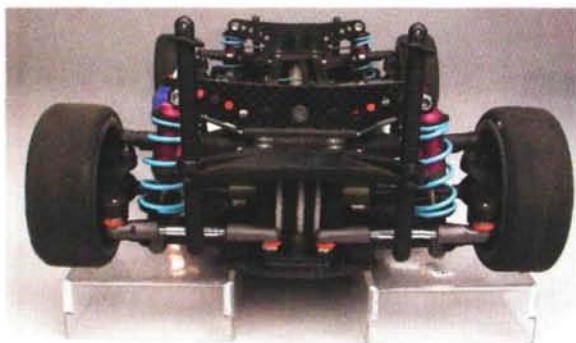
Get your lid on straight by Bob Hastings

It happens to all of us at some point; you have a fresh body ready to go on a killer chassis. You've cut out the wheel wells, drilled your body-post holes, dropped the new shell into place and nothing is aligned properly. This common and costly mistake not only looks bad and affects your vehicle's handling but, even worse, it may mean also that you have to buy a replacement body and start all over. Let's put an end to the misaligned body malady forever. Whether your body is clear or prepainted for electric or nitro, the steps given here will help you get it mounted straight and level, quickly and easily—the first time.

The easiest way to mount your body correctly is to mark it while it is unpainted. We demonstrate the proper technique on this Parma Panoz touring body.

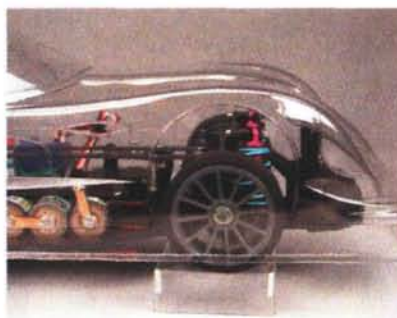
Step 1. Raise the chassis

Block the wheels up off the workbench; use any flat surface that doesn't protrude beyond the wheel track. When the body is placed on the chassis, the excess body material should hang unobstructed. If it is obvious that your body posts are excessively long, shorten them before you proceed.



Step 3. First cut

For the initial trim, cut the front and rear flanges off to set the body's ride height. It's easier to do this before the body has been painted because you don't have to be concerned about scratching the paint while making adjustments. Cut along the body line from the front fender well toward the nose of the car. Always use a pair of sharp body scissors and make only short cuts. When the front is finished, move on to the rear of the car and trim it in the same manner.



Step 2. Center the wheels

Align the wheels within the front wells, and check the body alignment from side to side. If the front is OK, the rear should be as well, but it doesn't hurt to double-check. Once you're confident that the body is square, mark the locations for the body-post holes with a permanent marker. Never trust the body's embossed dimples until you're positive that they're aligned for your particular chassis.



Step 4. Side flanges

Hang the body over the edge of your bench, and use a clean pit towel to cushion it for these final two cuts. Place a metal straightedge along the body's lower cut line, and carefully score it with a hobby knife (always use a new no. 11 blade). Fold the flap inward, and the Lexan will snap cleanly at the score line. Repeat the process for the flange on the opposite side.

Put the body back on the chassis, make any final height adjustments, and then mark the center point of the axles. If you have a nitro vehicle, mark the necessary access holes for starting, exhaust and tuning. Clean up any ragged edges with a piece of sandpaper.



- YOU'LL NEED**
- Permanent marker
 - Hobby knife
 - No. 11 hobby blades
 - Straightedge
 - Body scissors (Lexan-type)
 - Sandpaper or emery board
 - Paint
 - Masking tape
 - Body reamer
 - Circle cutter (optional)



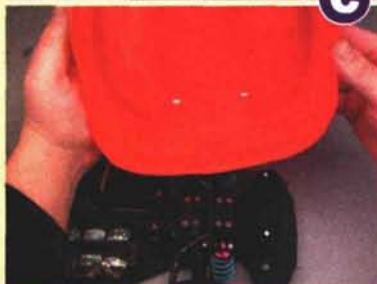
Step 5. Bath time

To prep the body for painting, wash it as you normally would before a paint job and tape off the body-post holes to prevent overspray from sneaking through. It's also a good idea to lay down a strip of tape at each axle so you'll have a window for trimming the wheel wells. Mask the windows and lay down your paint. We'll cut out the rest of the body later.



PREPAINTED BODIES

Repainted bodies such as this one from Team Orion unquestionably look great, but it can be a bit of a challenge to mount them because you're literally working in the dark. Here are a few tips to help you line everything up correctly.



A Cut a small notch in the front wheel wells so you can more readily see the body's alignment with the chassis.

B Shine a flashlight from underneath the chassis, and you should be able to clearly make out the front body-post locations.

C If the body is too heavily painted for the flashlight trick to work, paint the tips of the body posts with water-based paint. While the paint is still wet, lower the body onto the posts, keeping an eye on the alignment of the fender wells and wheels. Press the body lightly against the posts; be careful not to slide it around. Lift up the body, and there will be small dots of paint in the precise locations of the body posts. Ream the front holes and then move on to the rear.

Step 6. Cut wheel wells

After the paint has been applied, it's time to finish the wheel wells. The Panoz is typical of touring cars that have an arch at the top of the fender and straight sides. The Olfa circle cutter makes life easier on the radiused portion, and the rest can be trimmed with body scissors. Use the same setting on the cir-



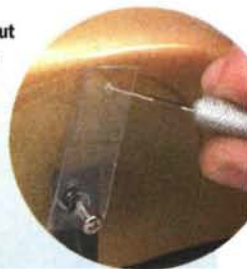
cle cutter for all four wheel wells and for a finished appearance, round off the corners with the body scissors.



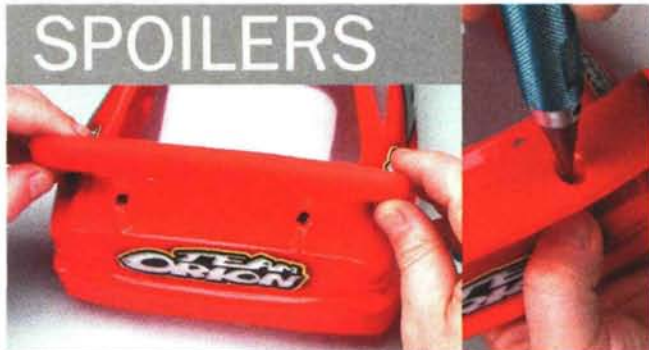
Simple Circles

You don't own a circle cutter? If you're committed to remaining in the Dark Ages, here are two tricks that make it easier to cut wheel openings. Grab a tire that's the same size as the one you're creating an opening for. Match it up with the wheel on your chassis outside the body, and trace around it with a permanent marker. The line will be slightly larger than the tire itself, and that's exactly what you want. Carefully cut along the line with curved body scissors.

If you don't want to rely on a steady hand to cut wheel wells accurately, use a piece of scrap Lexan as a compass. Anchor the Lexan with a screw at the axle mark and poke a hobby knife through the other end outside the perimeter of the tire. Score the outline of the opening, remove the scrap Lexan and cut from the pivot hole to the scribe line with a pair of body scissors. Peel out the circle, and there you have it—a perfect wheel well.



SPOILERS



Have you ever driven a car with a poorly mounted spoiler? It looks hack, can cause the car to track "funny" and can

reduce rear downforce. The easiest way to get it right the first time is to use a small piece of double-stick tape to align the wing with the body. Then drill through both at the same time. The spoiler's side dams can be servo-taped into place, or for a trick look, fastened with plastic pop rivets available from BRP.



SOURCE GUIDE

BRP (440) 284-0270; www.brpracing.com.

OLFA PRODUCTS GROUP (800) 962-6532; www.olfa.com.

PARMA/PSE (440) 237-8650; www.parmapse.com.

TEAM ORION (714) 694-2812; www.team-orion.ch.

Body mounting doesn't have to be difficult, but you can't leave things to chance. Always remember that it takes less time to do it right the first time than to do it over. Leave the rushing for when you're leading down the back straight with that new body. ■

Novak Ionic and Millennium Pro Chargers

Orange juice

by George M. Gonzalez

Novak has enlarged its charger line with two new models designed to charge a wide variety of battery packs including the latest NiMH cells. The Ionic is a straightforward charger that's big on features and easy on your wallet. The Millennium Pro replaces the Millennium as Novak's flagship charger; it has built-in Pit Wizard software—a great feature that allows you to program Novak's Cyclone series and Atom ESCs to match your driving style and needs. Both chargers use Novak's exclusive Ni-MH2 triple-detection charge mode that's designed to safely charge NiMH cells of all sizes. That's the claim; I tested the Ionic and the Millennium Pro to see whether Novak really has solved NiMH charging, and I put the chargers' other features through their paces.



THE IONIC is ideal for electric- and nitro-power enthusiasts who are looking for an affordable, easy-to-operate battery charger that can charge Ni-Cd and NiMH cells of various capacities and cell configurations. The Ionic borrows its two charge modes from the Millennium Pro to ensure that your battery packs are completely charged without the risk of overcharging and false peaking. AC/DC and DC-only models are available to suit your needs; I tested the AC/DC version.

OPERATION

After you plug the Ionic unit into a wall socket, it takes a few seconds to switch on; that's because the charger performs a quick diagnostic test to make sure that all systems are "go." The LEDs flash and then scroll across the keypad three times before the charger sets all the charge parameters to the default settings (Ni-Cd charge mode, 4A charge rate and 6-cell battery pack). This is a great default setting if you're going to primarily charge 6-cell Ni-Cd packs.

It's simple to program the Ionic. Press the Select button to choose the charge mode (Ni-Cd or Ni-MH2) and then push the Enter/Start/Stop button to confirm your selection. A single LED lights up above the charge mode that you selected. Next, use the Select button to choose the amp rate, and then push the Enter/Start/Stop button to confirm. An LED will light up

above the amp rate that you chose. Follow the same sequence to select the number of cells, and you're ready to charge.

Push the Enter/Start/Stop button to start the charge cycle. The "Charger On" LED flashes three times and then glows solid red during charging. When the battery pack has fully peaked, all the LEDs light up and scroll across the keypad. The Ionic also remembers the previous charge settings—a nice feature to have on race day, when you're charging the same type of battery pack all day long.

CHARGING

I charged a variety of battery packs, including 7-cell, 2400mAh Ni-Cds; 6-cell, 3000mAh NiMHs and 5-cell, 1100mAh NiMH receiver packs. The Ionic charged them all without a single false peak. The Ionic even successfully charged a well-worn, false-peak-prone 2000mAh Ni-Cd stick pack that I had set aside for proper disposal. The pack triggered the Ionic's battery-conditioning feature, which delayed the charge cycle for approximately 3 minutes, but in the end, the pack received a complete charge. Just for the heck of it, I hooked up the pack to a 10-bulb discharger that draws approximately 20 amps. The pack ran the bulbs for 286 seconds before I cut off the load at 5.4 volts. Looks as though I'll be hanging onto that pack after all!

I noticed that the Ionic did a particularly good job of charging all my

FEATURES

USER-FRIENDLY OPERATION. Thanks to its angled keypad and bright, easy-to-see LEDs, the Ionic is easy to operate. The membrane-type keypad uses just two buttons to set up each charge session: "Select" and "Enter/Start/Stop." The Select button sets the charge mode, the charge amp rate and the number of cells in the battery pack, and the Enter/Start/Stop button performs three functions: along with the Select button, it confirms each setting, and it also starts and stops the charge cycle.

BATTERY CONDITIONING. Before each charge cycle, the Ionic analyzes the battery pack, and if necessary, it attempts to condition the pack with a low-amp trickle-charge to bring up individual cell voltages. This ensures a successful charge without reversing the voltage of one of the cells, and it prevents annoying false peaks. It takes only a couple of seconds for the Ionic to check the battery pack's condition; however, if the battery pack requires conditioning, it may take a few minutes for the charge cycle to begin. The "Charger On" LED flashes during analyzing and conditioning.

DUAL CHARGE MODES. In the Ni-Cd mode, the Ionic uses a constant-current linear charge and a voltage-threshold setting of 12mV/cell to determine when your Ni-Cd battery pack is completely charged. The Ni-MH2 mode uses a carefully refined NiMH-specific algorithm and Novak's exclusive triple-detection system to prevent false peaking and ensure that the NiMH cells are given a complete charge without being overcharged or overheated. The end result is cooler battery packs, and that translates into longer cell life.

The Ionic can charge 4- to 7-cell battery packs in AC operation and 4- to 8-cell packs in DC operation with an external power supply. Three charge rates are available (0.5, 1 and 4 amps). The Ionic can also

charge 8 cell transmitter packs (when used with an appropriate power supply) and delicate receiver batteries.

FULLY PROTECTED. The Ionic is protected from input and output reverse polarity, short circuits, shorted batteries and thermal overload.

BUILT-IN COOLING FAN. The Ionic's cooling fan is installed directly above a huge internal heat sink, so back-to-back charging sessions won't overheat the charger. The fan runs whenever the Ionic is charging, or anytime the internal circuitry senses a difference between the ambient temperature and charger temperature that's significant enough to warrant extra cooling. The rugged molded case is vented to draw cool air into the unit, and a series of drilled holes that spell "Ionic" allows air to escape and thereby keeps the internal power supply cool in the AC/DC model.

AC/DC OPERATION. Nothing beats AC power for convenience; just plug it in and start charging. The Ionic has a built-in 12V power supply, so you don't need to rely on a car battery or external power supply to run the unit. Large alligator clips, cables and connectors are included to hook up the Ionic to an external 12V power supply or battery. If you wish to use your existing power supply, Novak also offers a DC-only version of the Ionic.

REMOVABLE POWER LEADS. The Ionic has long, 22-inch output leads with alligator clips on one end to hook up your battery packs and connectors on the other end that are attached to positive and negative terminals on the charger. Removable output leads are a great feature because racers may want to attach custom output leads with various connectors to fit a variety of battery packs.



IONIC

NiMH battery packs, each of which rolled off the charger just slightly above the ambient temperature. The Ni-MH2 charge mode really works! The true test came when I charged some tiny 600mAh NiMH AAA batteries that power my Kyosho Mini-Z. I installed the batteries in a 4-cell battery holder and selected the Ni-MH2 charge mode and 0.5A charge rate. Approximately 40 minutes later, the cells were fully charged and slightly warm. As a final durability test, I charged 4, 2400mAh 6-cell battery packs back-to-back outdoors under direct sunlight. The Ionic charged the packs without a hiccup and remained cool throughout the process.

THE VERDICT

The Ionic is a rugged, high-quality piece of equipment. It performed very well during testing, and it even charged an old battery pack that hadn't been used for more than 2 years and was presumed dead. Racers who believe high amp rates are important to punchy battery performance may wish the charger had a higher maximum charge amperage, but the Ionic's 4A max is plenty for proper, safe (and still fast) pack charging. And based on my own real-world driving tests with Ionic-charged packs, I was never short of punch.

Case size	5.1x4.2x2.8 in. (12.95x10.67x7.11cm)
Weight (AC/DC version/DC-only version)	13.8 oz. (391g)/22.56 oz. (640g)
AC input voltage (AC/DC model)	100 to 240 volts AC
DC input voltage (w/built-in power supply)	12 volts DC
DC input voltage (w/external DC power supply)	12 to 15 volts
Charge modes	Novak Ni-Cd linear and Ni-MH2
Charge capability (w/built-in power supply)	4 to 7 cells (4.8 to 8.4 volts)
Charge capability (w/external DC power supply)	4 to 8 cells (4.8 to 9.6 volts)
Charge rates	0.5, 1 and 4 amps
Circuit protection	Input and output reverse voltage Thermal overload Short circuit and shorted battery
Part no. (AC/DC model/DC model)	4475/4476
List price (AC/DC model/DC model)	\$239/\$139

"Khan"-ceptual engineering

Adnan Khan is Novak's engineering manager and the cornerstone of Novak's product development team. He was instrumental in the design of the Ionic and Millennium chargers, so we went straight to him to clear up some of the myths about NiMH battery charging.

RADIO CONTROL CAR ACTION: What is the most misunderstood aspect of NiMH charging?

ADNAN KHAN: Many hobbyists assume NiMH batteries can be charged like Ni-Cd batteries, and this just isn't the case. Most Ni-Cd batteries are charged using the delta-peak method, but this type of charging algorithm [method of performing a given function] can actually harm the NiMH batteries by overheating the cells during charging. If you overheat the battery during charging, the voltage will go flat early during discharge.

RCCA: Is proper NiMH charging a matter of hardware, software, or both?

AK: To properly charge NiMH batteries, one must have the right combination of hardware and software. The Novak Millennium Pro was especially designed with the new NiMH batteries in mind. We use high-accuracy, analog-to-digital conversion circuitry to measure the battery voltage. We then combine this voltage data with our unique battery-charging algorithm, which uses several pieces of data and digital-signal processing to decide whether the battery is charged. With this technology, we can charge the batteries without overheating them.

RCCA: The original Millennium charger made the term "voltage threshold" part of the electric racing vernacular more than two years ago, but there still seems to be a lot of confusion about what "voltage threshold" actually is, and why you might want to adjust it. Can you explain it?

AK: Voltage threshold refers to the amount of voltage drop during battery peaking. This type of charging applies only to Ni-Cd batteries. When a Ni-Cd battery is nearing charge completion, its voltage actually starts to go down. The difference between the peak voltage and how far the voltage is allowed to drop before the charger signals that the pack is fully charged is referred to as the voltage threshold. The voltage threshold also determines the battery temperature at charge termination. The greater the voltage threshold, the higher the battery temperature.

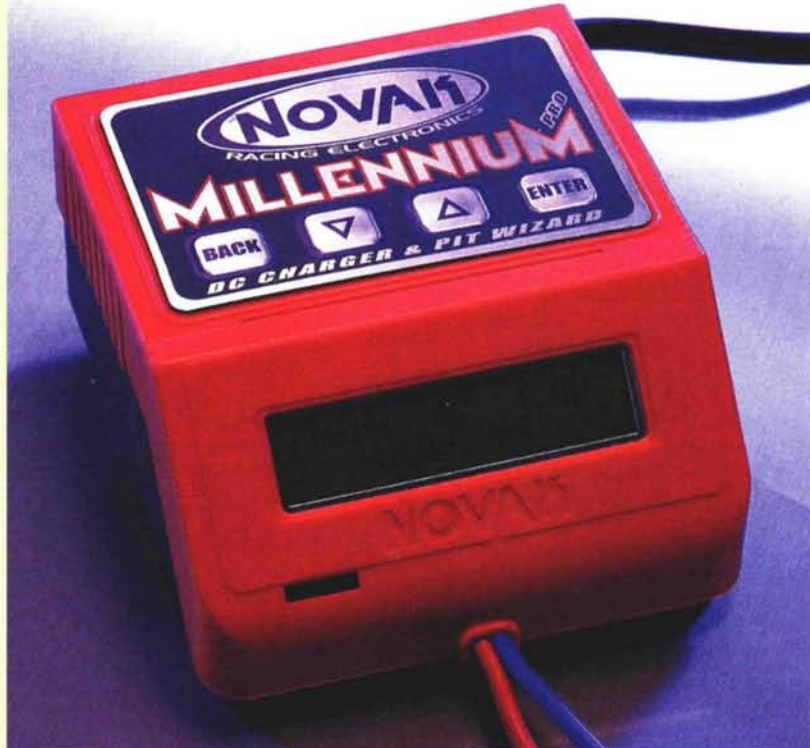
RCCA: Many racers believe that charging their Ni-Cd and NiMH cells at a higher amp rate will give the cells more punch throughout the discharge curve. If this is true, why did Novak settle on a 4A max charge rate for the Ionic charger?

AK: In all of our extensive, in-depth testing of NiMH batteries, in which we very carefully logged and analyzed all the data, we found no data to support the claim that charging Ni-Cd and NiMH cells at a higher amp rate will yield higher average voltage discharge numbers. We did find that charging at the rate of 4 amps gave the quickest charge time without overheating the battery pack. At a 4A charge rate, the charge termination temperature is between 115 and 120 degrees Fahrenheit. This translates to a good average voltage during discharging and longer battery life. We do not recommend charging NiMH batteries at 7 amps.

RCCA: Do you have any tips on charging and maintaining NiMH battery packs?

AK: Charge the batteries at around 4 amps, and avoid overheating the battery pack during charging and discharging. Overheating kills the battery pack, and after a few runs, the pack will go flat and run time will suffer. Do not discharge the pack using bulbs or resistors, as this allows some cells in the pack to go negative.

If the pack has been left discharging for a long time, charge it at a lower current the first time and then cycle it once or twice; the pack will perform as it did before.



THE MILLENNIUM PRO is Novak's entry in the top-shelf battery-charger arena and is the successor to *Car Action's* two-time Readers' Choice Award-winning charger, the Millennium. The Pro model is loaded with features to meet the demands of discriminating racers, and it matches the original Millennium for dependability and ease of use. Its most impressive highlights include Novak's special Ni-MH2 charge mode that's designed to exploit the performance capabilities of the latest generation of NiMH sub-C cells, and its built-in Pit Wizard software, which is a major bonus if you happen to own a Novak programmable ESC.

OPERATION

The Pro is easy to operate but has many charge parameters to adjust, so it might be a while before you can hit the magic button that starts the charge process. You'll need to go to the "Edit Charge" screen to choose a custom charge profile. Pressing the up and down arrow keys allows you to scroll through the Pro's various controls and adjustments, while the "Enter" button confirms your settings. The "Back" key is used to back up if you make a mistake. By using the function keys with the easy-to-follow prompts on the screen, you'll be able to choose the charge mode, number of cells, charge amp rate, trickle-charge on/off option, trickle-charge rate and the voltage threshold before you charge a battery pack. That might seem like a lot of button pressing to charge a battery pack, but the process really doesn't take long, and if you plan to use the settings frequently, you can save them as one of the five preset charge parameters.

CHARGING

I tested the Pro's limits by charging every battery pack in my arsenal, including 4- and 5-cell, 600 to 1100mAh Ni-Cd and NiMH receiver packs and a variety of sub-C, 1700 to 3000mAh Ni-Cd and NiMH 6- and 7-cell battery packs. The Pro worked flawlessly during testing; it charged every battery pack without a single false peak. Again, I was impressed with the Ni-MH2 charge mode; my battery packs rolled off the charger fully charged and cool to the touch. The Ni-Cd reverse-pulse charge mode is a powerful tool that can bring your old, tired battery packs back to life. I noticed an increase in punch and run time from some of my old battery packs that I use for backyard bashing. I also created my own custom charge profiles for charging the 4- and 7-cell battery packs, but most of the time, I relied on the built-in charge profiles because they cover most of my battery-charging needs.

THE VERDICT

The Millennium Pro has all the features that racers need along with many whistles and bells that make it a joy to own. The charger performs many complicated functions, but it's easy to understand and operate. The Ni-MH2 charge mode provides peace of mind by ensuring that your delicate NiMH cells will not suffer from over-charging, and the built-in Pit Wizard software is a bonus if you own a Novak programmable ESC. The Millennium Pro performs as advertised and produces perfectly charged battery packs every single time.

"Pit Wizard"-ry revisited

The Millennium Pro's Pit Wizard software accesses a hidden fourth profile in which you can modify various performance parameters of your Novak Atom or Cyclone-series ESC. Here's what you can tweak:

Dead band. This is the space between minimum drive and minimum brake (neutral dead-band area). Increasing the dead band will increase the space within the neutral dead-band area and require more trigger movement (travel) to engage minimum drive or minimum brake. Decreasing the dead band narrows the space and requires less travel to engage minimum drive or minimum brake.

Drive frequency. The frequency in hertz (Hz) in which the ESC sends drive information to the motor. Increasing the drive frequency tends to make the ESC's output feel smoother and more linear. Decreasing the drive frequency has the opposite effect and results in a punchier throttle feel. The Cyclone-series ESCs (and the Atom) can be programmed to operate at frequencies as high as 23,400Hz or as low as 122Hz.

Minimum Drive (percentage of full throttle). Determines how much throttle will be applied to the motor at the ESC's lowest possible "speed." Increasing the Minimum Drive applies a greater percentage of full throttle with initial trigger movement—good for high-traction conditions and makes heavier vehicles feel more responsive. Decreasing the Minimum Drive applies less percentage of throttle with initial trigger movement—great for low-traction conditions and makes lighter vehicles more controllable.

Brake PWM frequency. Frequency in Hz at which the ESC sends brake information to the motor. Increasing the brake frequency lowers the initial braking force to make lighter vehicles

more controllable during initial braking, and heavier vehicles brake less "reactively." Decreasing the brake frequency does the opposite; it increases the initial braking force, making heavier vehicles more reactive and lighter vehicles less controllable during initial braking.

Drag Brake Value (percentage of full brake). Amount of drag brake applied when the throttle trigger is in the neutral position. A higher value applies more drag brake, while a lower value decreases the amount of braking when in neutral.

Drag Brake Toggle. Determines how the ESC's brake pot will be used. If the drag brake toggle is switched off, the ESC's brake pot adjusts the minimum brake value, and the PWS can be used to adjust the drag-brake value. This allows you to set the minimum brake higher or lower than the drag brake setting. If the toggle is switched on, the ESC's brake pot adjusts the drag brake value at the brake frequency, and this valve also serves as the setting for minimum brake. The PWS cannot be used to alter the drag brake value if the toggle is switched on, and the ESC will not recognize a programmed drag brake value.

Drag Brake frequency. Frequency in Hz that the ESC sends drag brake information to the motor. Increasing the drag brake frequency makes the braking feel subtler when the trigger is in the neutral position. Decreasing the drag brake frequency makes the braking feel more reactive when the trigger is in the neutral position.

Neutral, full throttle and full brake position. These parameters are programmed into the ESC during the one-touch setup and are not usually changed, as any modifications will alter the one-touch programming. The position of each function relative to the transmitter's trigger travel, however, may be adjusted with the PWS.

For an in-depth look at the software's many adjustable parameters, check out the "Pit Wizardry" article in the May '98 issue of *Radio Control Car Action*.

FEATURES

LCD DISPLAY. The Pro has a large, 16 character, two-line, backlit LCD display with user-selectable contrast control. During the charge process, the Pro displays the charge time, battery voltage, charge mode, charge amp rate, number of cells and the voltage threshold (voltage threshold does not appear in Ni-MH mode, as the Millennium does not use voltage threshold to detect a peak charge in that mode). When the charge cycle is completed, the alarm tone sounds and then the battery pack's peak voltage, capacity in milliamp hours, total charge time and the pack's energy in "J" (joules) are displayed. The previous charge history is retained in memory and can be accessed by selecting the "Last Charge Info" option.

TRIPLE CHARGE MODES. The Pro has three charge modes to handle a variety of battery-charging tasks. The Ni-Cd linear charge mode is designed for charging Ni-Cd cells from 0.5 to 7 amps. The Ni-Cd Reverse Pulse charge mode is great for charging battery packs that have not been charged for a while. To help increase the battery's run time and average discharge voltage while decreasing internal resistance, the reverse pulse duration can be adjusted between 5 and 20 milliseconds (ms). The Ni-MH2 charge mode uses Novak's exclusive triple-detection mode to safely charge NiMH cells of all sizes.

In all modes, the Pro can charge 4 to 8 cells, and the charge rate is completely adjustable from 0.5 to 7 amps in 0.1A increments. The voltage threshold can be adjusted from 2mV/cell to 20mV/cell to ensure that the battery pack receives a complete charge without the risk of overcharging.

DELAYED CHARGE. This is a cool feature that allows you to delay the start of the charge cycle—great for when you want to take a lunch break, but you don't want to have to rush back to peak your pack. The Pro can be programmed to delay the charge process from 1 minute to 6 hours, in 1-minute increments.

PROGRAMMED CHARGE PROFILES.

The Pro has five preprogrammed charge profiles that cover a wide variety of charging applications. It saves time to choose a charge profile rather than having to select the charge mode, charge rate, number of cells and other charge parameters that are necessary to begin the charging cycle.

BATTERY CONDITIONING AND SELF-DIAGNOSTICS. Every time you hook it up to a power supply, the Pro performs a quick systems check. The diagnostic test takes only a few seconds, and then the word "passed" appears on the screen. If something is wrong with the charger, the battery pack, or the connections, the Pro's screen displays an error message.

The Pro features Novak's unique battery management system that analyzes every pack before charging and, if necessary, conditions the pack with a low-amp trickle-charge to bring up individual cell voltages to ensure a successful charge with fewer false peaks.

FULLY PROTECTED. The Pro is protected from input and output reverse polarity, input and output short circuits, shorted batteries and thermal overload. Two user-replaceable 15A fuses are underneath the unit, and Novak provides a slot for a spare fuse (included).

INTERNAL HEAT SINK AND FAN. A built-in cooling fan keeps the Pro cool during charging. Air is drawn up through a vent on the bottom of the charger and is

directed out through exhaust vents on both sides of the case. The Pro remains stone-cold, even after marathon charging sessions.

PIT WIZARD SOFTWARE (PWS). Novak's PWS is built into the Pro and includes the MP D-Link2 harness that is directly connected to the Cyclone C2 and TC2 ESCs. The original Cyclone, Cyclone TC and Atom require Novak's optional MP Classic D-Link harness to use the Pro's PWS. Check out the "Pit Wizard-ry revisited" sidebar for more information on the built-in PWS.

PERSONALIZED SETTINGS. The Pro's five preprogrammed charge profiles can be altered and renamed to suit your charging needs, and you can even change the title screen that is displayed when the Millennium Pro powers up. You can also select one of 10 alarm tones, so you'll be able to tell when your Pro is signaling a fully charged pack without being confused by the sound of other racers' Millennium Pros. ■

MILLENNIUM

Case size	4x4.38x2.33 in. (10.16x11.13x5.92cm)
Weight	14.2 oz. (402g)
Input voltage	12 to 15 volts DC
Charge modes	Ni-Cd linear, reverse pulse and Ni-MH2
Charge capability	4 to 8 cells (4.8 to 9.6 volts)
Charge rate	0.5 to 7 amps (adjustable)
Trickle-charge rate (linear; after peak)	0.1 to 0.4 amp
Reverse-pulse duration	5 to 20 milliseconds
Circuit protection	Input and output reverse voltage Thermal overload Short circuit and shorted battery
Part no.	4490
List price	\$265

SPECIFICATIONS

Tuning & Modifying the Tamiya TXT-1



The Tamiya TXT-1 is a big hit because of its realistic looks, incredible suspension articulation and stump-pulling torque. Though it's more than capable in stock form, it's natural to look for ways to improve on a kit. This month, let's ramp up the TXT-1's performance, handling, durability and looks with competition-quality electronic gear, some hot hop-up parts and a few choice mods.

CHASSIS

To streamline the chassis, I cut the plastic bumpers off each end and removed the front electronics tray, battery holder and body mounts. I designed a new receiver, ESC mount and battery tray on a CAD system and sent the files to Penguin RC to have the new parts made out of carbon-fiber plate. To get the battery to sit as low as I could get it in the chassis, I machined standoffs that would lower the front of the battery

tray in the chassis. I secured the battery using the cups and hold-down from the Tamiya TB Evolution sedan; keep it in the family, right?

DRIVE TRAIN

To get a little more speed out of the TXT-1, the stock pinion gears were replaced with 19-tooth steel pinions from Robinson Racing, and I freed up the drive train by replacing the bushings with high-quality rubber-sealed ball bearings from Tamiya.

There has been some discussion about the backlash in the TXT-1's universal drive shafts, and I wondered whether I'd be able to come up with a mod that would reduce it. After doing a little research, I found that the output-shafts diameter is 6mm, which is the same as the Traxxas E-Maxx center output shafts. MIP offers a CVD kit for the center drive on the E-Maxx, but the bones for that kit aren't long enough for the TXT-1, so I ordered two that would fit the E-Maxx axles. I attached them to the stubs from the E-Maxx center-drive kit, but the modified center drive was then a bit too long for the

TXT-1's stock wheelbase (see the next section on suspension to find out how I solved this problem). If I had had a little more time, I'm sure that I would have been able to find an 1/8-scale bone to fit the truck's stock wheelbase perfectly. The CVDs now have a lot less backlash than the stock units, and they are rebuildable, too.

SUSPENSION

The TXT-1 standard suspension is fine right out of the box, but since this is a "project" truck, I wasn't about to leave it bone stock; admittedly, I went a little overboard. I replaced the stock shocks with long, threaded shocks from Team Losi; they allow easy ride-height adjustment, and the tuning options are endless because Team Losi offers a wide variety of shock pistons, shock oils and springs.

The shocks are connected to aluminum cantilevers from New Era. They have many mounting holes that further expand the suspension tuning possibilities. I replaced the stock cantilevered links with Team Associated blue Ti turnbuckles and Rocket City ball ends. The cantilever, suspension links and steering servo are mounted on the lower bumpers.

Since these components put stress on the stock plastic bumpers, I installed a set of aluminum bumpers from New Era for added reliability.





Four Team Losi threaded shocks support my TXT-1 chassis. They are mounted on aluminum cantilevers from New Era.

My Maxx CVDs were a little too long for the stock suspension, so I planned to machine longer suspension arms and replace the stock ball ends with Rocket City units. When I laid out the pieces to measure them and figure out how long the arms should be, I discovered that the new ball ends were longer than the stock ones and that a 4mm nut between the ball end and suspension link would extend the wheelbase enough to fit the CVDs. My TXT-1 suspension went from 13 inches to 14.25 inches; the longer wheelbase adds stability, but it does increase the turning radius a bit.

A zip-tie secures the swaybar, and swaybar tension is adjusted by moving it up or down on the suspension arm. The zip-ties rarely stay in place and often tear; to avoid this, I bought split-gear hub clamps from Stock Drive Products and machined a slot in them to clear the swaybars; they hold the swaybars securely.

I wanted to improve the truck's looks, so I polished some of the aluminum parts. I removed the clear anodizing from the suspension arms and steering links with oven cleaner and threw them into my tumbler to clean up the aluminum surfaces. The cantilevers and bumpers from New Era had machine marks, so I threw them into the tumbler with the links. I also polished the gear-box heat sinks and my new swaybar clamps. After a couple of days in the tumbler, the parts had a

smooth, satin finish. A little buff and polish on the suspension arms brought them to a mirror finish; while I was at it, I polished the bumpers and cantilevers on a buffing wheel.

STEERING

Many people have commented that the servo mounts on the TXT-1 flex too much, and that it affects how well the truck tracks. I also found that the servo-saver is a little weak, so I replaced it with a heavy-duty unit from Kimbrough and fabricated an aluminum servo mount for the servo.

I planned to replace the stock plastic servo mounts with machined-aluminum ones made out of 1/4-inch-square stock, but I realized

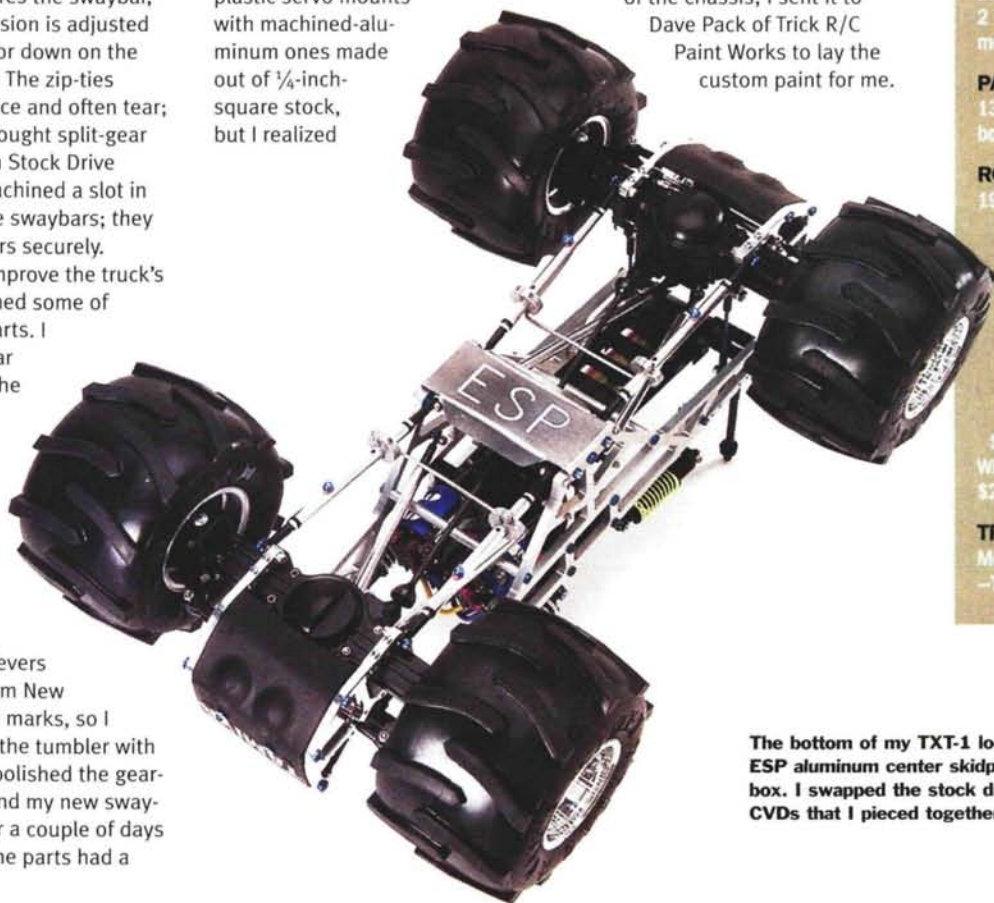
that the servo would then still flex a little because the pieces are independent of each other. So, I machined a new mount out of 1/4-inch-thick aluminum plate, and I replaced the stock lower steering links with ESP aluminum links and the upper links with adjustable Ti units from Lunsford Racing.

ELECTRONICS

An Orion 6-cell Rocket Pack gives juice to the Novak Super Rooster ESC, which is a heavy-duty unit and a perfect choice for dual-motor monster truck applications. Two Orion chrome modified 16-turn motors replace the stock Mabuchi motors, and Trinity E-Maxx heat sinks keep the temperature of the motors to a minimum. An Airtronics 94737 servo turns the wheels, and an Airtronics CX2P radio sends the signals to my ride.

BODY WHEELS AND TIRES

I love the TXT-1 stock rims, so I left them on the truck for this project, but I was looking for a little more grip than the stock tires provided. I replaced them with truck-pull tires from Imex; they look great and are lighter than the stock ones. A long-wheelbase Parma Ford F-150 body sits on top of the chassis; I sent it to Dave Pack of Trick R/C Paint Works to lay the custom paint for me.



PARTS LIST

AIRTRONICS

CX2P radio—0226FM, \$149.99
Servo—94737, \$74.99

DURATRAX

Black nylon 3.5-in. body posts—2617, \$2.99

ESP

Heavy-duty tie-rod set with ball links—ESP061, \$49.95

IMEX

Clod Buster/TXT truck-pull tires—7595, \$24.99

KIMBROUGH

Large servo gear saver—121, \$6.99

MIP

E-Maxx center-drive kit—1495, \$55
T-Maxx CVD bone—1487, \$15/each

NEW ERA

Cantilever levers—TXT418, \$42.95/set
Lower supports—TXT822, \$39.95/pair

NOVAK

Super Rooster ESC (reversible)—1860, \$119.99

ORION

Rocket Pack 6-cell, 2400mAh battery pack—10206, \$35.99
2 16x2-turn chrome modified motors—23106, \$95

PARMA/PSE

13-in. wheelbase Ford F-150 body—10188, \$24.99

ROBINSON RACING

19-tooth, 32-pitch pinion gear—0190, \$3.99

TEAM LOSI

2 threaded shock bodies—LOSA5056, \$19.95
2 shock sets hard-anodized—LOSA5034, \$29.99
Yellow springs—LOSA5148, \$2.50/pair
White springs—LOSA5147, \$2.50/pair

TRINITY

Motor heat-sink set E-Maxx—TK5116, \$26.99

The bottom of my TXT-1 looks just as good as the top! An ESP aluminum center skidplate protects the center gearbox. I swapped the stock drive shafts for a set of MIP CVDs that I pieced together to custom-fit the truck.



Above: these bumpers are from New Era. I removed all the machine marks and polished them to a mirror shine. For the steering servo, I machined a custom one-piece mount out of a 1/4-inch-thick aluminum plate. This mount eliminates just about all servo flex. Top right: to lower the battery in the chassis, I designed a new battery mounting system. The bottom plate was designed on a CAD system and made by Penguin R/C; the battery cups and battery strap are from the Tamiya TB01 Evolution kit. Bottom right: the driving force for my TXT-1 are two 16-turn Orion chrome modified motors. They are surrounded by Trinity E-Maxx motor heat sinks.



The stock body mounts are a little bulky, so I replaced them with universal body mounts from DuraTrax. To mount them, I drilled holes in the top of the chassis and tapped them with 4-40 size threads; I then took a piece of 4-40 threaded rod and screwed it into each body mount. Once that had been done, I applied a little red thread-lock to the fasteners and screwed the body mounts to the chassis.

PERFORMANCE

I charged up my TXT-1 and headed out to the front yard of the home-stand for some testing. When testing the stock truck with executive editor Peter Vieira, I noticed that I had to finesse the throttle a little to prevent the truck from doing a wild, uncontrollable wheelie. With the 19-tooth pinions in the gearbox, the left front wheel came only an inch or two

off the ground. The truck doesn't accelerate as fast as it did before, but it's much more controllable and its top speed is much more impressive.

The softer suspension soaked up the small bumps in the yard with ease, and it jumped very well. My suspension setup is good, but I plan to spend a little more time tweaking it until I am completely satisfied with its performance.

It was a little harder to get the truck around tight obstacles because of its longer wheelbase, but that is nothing that 4-wheel steering can't take care of. After my first battery pack dumped, I checked the swaybar, and the clamps were still in the same places on the lower link. The zip-ties that formerly kept the swaybars in place would have moved at least halfway down the arm. ■

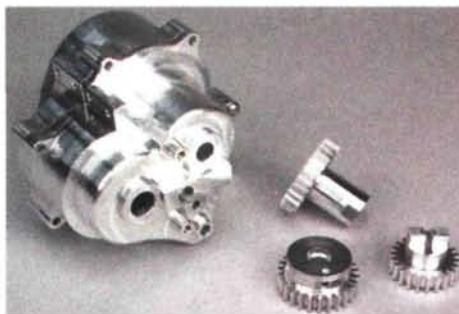


TRICK TRUCK STUFF

HARDCORE RACING COMPONENTS

Three-piece gear set and gearbox

Just when you thought you couldn't add any more after-market aluminum products to your T-Maxx, Hardcore throws you a bone. Its new 3-piece gear set and gearbox are sure to add beef to your Maxx. The gears are machined of strong billet aluminum, and the kit includes reverse and forward primary gears plus the forward output gear.



The tranny case is just beautiful! Each half is machined of billet aluminum and the finish is unreal. The case is a direct replacement unit and includes all of the necessary mounting hardware; just add your own stock gears. A setscrew in the gear case allows you to quickly lock out reverse gear.

T-Maxx transmission gears—HCR-03284, \$99

T-Maxx transmission case—HCR-03244, \$139

SOURCE GUIDE

- AIRTRONICS** (714) 978-1895; www.airtronics.net.
- DURATRAX** distributed by Great Planes (800) 682-8948; www.duratrax.com.
- ESP HOBBY MFG.** (262) 279-0900; www.esphobby.com.
- HARDCORE RACING COMPONENTS** (661) 294-5032; www.racinghardcore.com.
- IMEX MODEL CO.** (352) 754-8522; www.imex-model.com; imex.clodparts.com.
- KIMBROUGH PRODUCTS** (714) 258-7425; www.kimbrough-products.com.
- LUNSFORD RACING** (541) 928-0587; www.lunsfordracing.com.
- MIP** (626) 339-9007; www.miponline.com.
- NEW ERA MODELS** (603) 888-4453; www.neweramodells.com.
- NOVAK** (949) 833-8873; www.teamnovak.com.
- OFNA** (949) 586-2910; www.ofna.com.
- PARMA/PSE** (440) 237-8650; www.parmapse.com.
- PENGUIN R/C** (714) 630-9015; www.penguinrc.com.
- ROBINSON RACING** (209) 966-2465; www.robinsonracing.com.
- ROCKET CITY R/C SPECIALTIES** (256) 539-8358.
- STOCK DRIVE PRODUCTS** (516) 328-3300; www.sdp-si.com.
- TAMIYA AMERICA** (800) TAMIYA; www.tamiyausa.com.
- TEAM ASSOCIATED** (714) 850-9342; www.teamassociated.com.
- TEAM LOSI** distributed by Horizon Hobby Distributors (217) 355-9511; www.horizonhobby.com.
- TEAM ORION INC.** (714) 694-2812; www.team-orion.com.
- TRAXXAS** (972) 613-3300; www.traxxas.com.
- TRINITY PRODUCTS INC.** (732) 635-1600; www.teamtrinity.com.
- TRICK R/C PAINT WORKS** trickracing@hotmail.com.

TALK TRUCK!

Send your 4x4 questions and comments to Kevin Hetmanski kevinh@airage.com

Picture Perfect

Do you remember the Mercedes GT-1 car that was sponsored by CLK Sportswear? What set this racer apart from the rest was its photo-realistic, larger-than-life supermodel graphics; to me, it was the ultimate combination of speed and beauty. Unlike a typical painted mural, these weren't caricatures but true photographic reproductions that flowed within the lines of the car's bodywork. You can pull off this same effect with equally amazing results by laminating actual photos onto your RC body. Mike Ogle introduced this effect with his "Mabelynne" Volvo S-40 in the 1999 *RC Touring Cars* issue. Mike used white glue to do the job, but there are now specialized products for photo lamination. Parma offers FasKoat (which is also used as the carrier for Parma's FasGlitter), and XXX-Main offers Lexan Picture Glue. Whether you prefer spray cans or airbrush, you can achieve impressive results with a few well-picked magazine photos and some carefully chosen colors. Here's how.



The first two things you need are a body (this month I used a Frewer Vipa) and an idea; for a race-inspired theme, you could lift a manufacturer's logo from an advertisement, or you could go for the "babe look," too. It's really up to you, and as long as it's printed in a magazine, you can use it on your body.

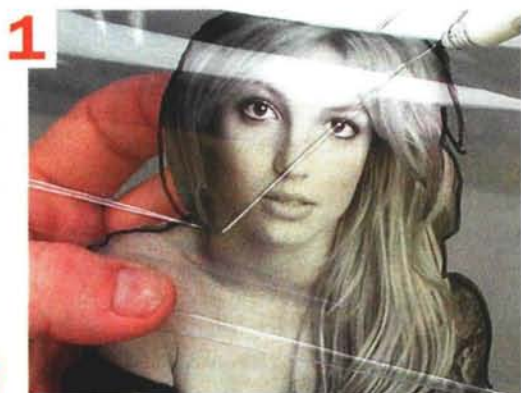
Gather your magazine images and trim them carefully using a sharp hobby knife or pair of scissors. It's important to crop the image as closely as possible for the best results. Wash the body with dish soap and water, and apply the window masks after the body has dried.

YOU'LL NEED

- Body
- XXX-Main Lexan Picture Glue
- Polycarbonate-compatible paint
- Magazine images
- Hobby knife or scissors
- Steel wool, wet sandpaper, or fine Scotch-Brite pad



Hold the photo inside the body and trace the perimeter of the picture on the outside of the body using a permanent marker.



TIPS

- Experiment by positioning the photos first to make sure that they'll work in a particular area; avoid compound curves, molded inlets and duct work.
- If any glue oozes out from behind the magazine image, remove any stray adhesive with a soft cloth and water.
- Resist the urge to reposition images or touch them in any way once they've been finally positioned.
- If you're proficient with airbrush control, you can create a shadow before the image is applied. Spray a light contour fade using the image's outline as a reference.
- Use colors that compliment the pictures, not draw attention away.



2

Scuff up the area where the pictures will be placed with a piece of steel wool or fine Scotch-Brite pad. Even though the body looks cloudy after scuffing, don't sweat it because this doesn't affect the finished look, and it promotes glue adhesion.

3

Liberal apply XXX-Main Picture Glue to the face of the magazine cutout, or spray the image with a wet layer of FasKoat.



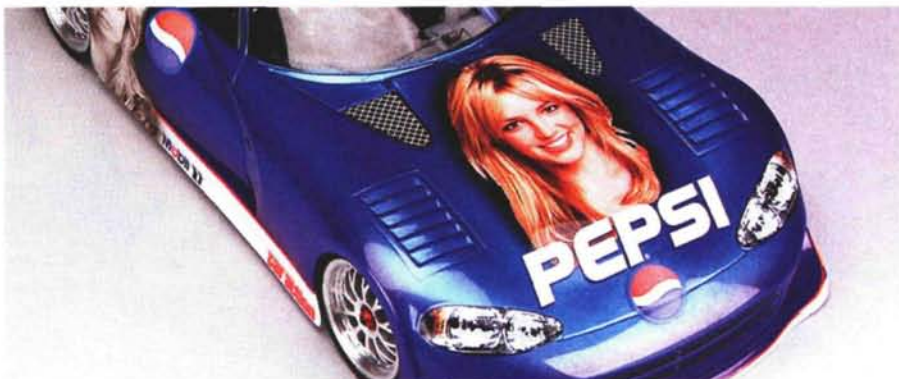
4

Carefully position the image according to your original outline. Work out any glue bubbles that form between the image and the body. Once all of the images are in place, set the body aside and allow the glue to dry. Don't handle the body until the glue has turned completely transparent.



5

Create a soft color transition around the picture using a darker color than the perimeter of the photo; this isn't necessary on images that have a solid-color border. Spraying paint in short bursts is usually enough to provide a soft fade, but an airbrush allows you to tightly control spray patterns in close on a graphic and gives faster transitions from photo to body color.



My long-standing adoration for Britney is no secret, and it was about time that I made a body as a tribute to her. The feeling is obviously mutual because she sings to me in the Pepsi commercial ("ba-ba-Bob-Bob-Bob").

BEAUTY and THE BEAST



What better way to accentuate the beauty of my Britneymobile than to show the hideous creature at the opposite end. On the backside of the car (how appropriate) is the guy who puts the monster in monster truck—Kevin Hetmanski. Never fear retaliation from a coworker whom you can outrun!

Complete the rest of your paint job in whichever style you choose, but remember that simpler is better here; you don't want wild body graphics to detract from the picture.

The laminating technique stretches the possibilities beyond what's practical using paint alone. Have fun, and be creative with your designs; just remember that Miss Spears is already taken! In the meantime, while I'm waiting for her call, go paint something! ■



FRESH PAINT

While flicking through the latest batch of pictures in the mail, I came across this sweet HPI Lexus owned by Dionisio Pichay from

Aruba. This classy-looking ride's black and purple base color captures the elegance of the luxury sedan, and blending the Faschange purple and Faschange blue flames gives the car a subtle yet aggressive look. Credit Tommy Smith from Falco Racing for the smooth paintwork. If you look closely, you can see that each flame is made from the same XXX-Main mask design. By separating the center flame and following the flow of the body with the upper and lower graphics, Tommy truly accentuated the car's lines. To see more of Tommy's paintwork, check www.falcoracing.com.

NEW IN THE SHOP

HPI

Micro RS4 Bodies

Chalk up another on the rapidly growing list of bodies available for the Micro RS4. This officially licensed Dodge Stratus from HPI fits the 140mm Micro chassis and is every bit as detailed as its larger touring sibling. HPI includes its precut vinyl graphics for fast finishing, like on this Super Touring car, or if you already have a 1/10-scale RC Stratus, you could make a downsized version of your model. Part no.—7606; \$16.



SOURCE GUIDE

PARMA INTERNATIONAL (440) 237-8650; www.parmapse.com.
FREWER Distributed by Schumacher (813) 889-9691; www.racing-cars.com.
HPI (949) 753-1099; www.hpiracing.com.
XXX-MAIN RACING (877) 744-6793; www.xxxmain.com.

CONTACT THE BODY SHOP

Send your Body Shop questions and comments to Bob Hastings bobh@airage.com

LRP Electronics Quantum Super Sport ESC

LRP'S QUANTUM SUPER SPORT ESC is very user-friendly in terms of size and setup. The included Tamiya plug and bullet connectors position the Super Sport as a mechanical-ESC upgrade (and it can certainly do that job), but with its adjustable features and exceptional performance it will be right at home on the racetrack. And, thanks to its super-small size, it will also be at home in any car.

FEATURES

SMALL SIZE. The most impressive feature of this ESC is its size. With a "footprint" that's just 1 inch square, the Super Sport is easily installed in the most cramped touring-car chassis or 1/12-scale machine. Micro-RC fans will be especially appreciative of its compact dimensions, and many Quantum-series ESCs

will likely find homes in HPI Micro RS4s and BRP 1/18-scale kits.

ADJUSTABLE PUNCH CONTROL (APC). APC stands for LRP's version of a current limiter. Dialing down the "power" pot on the face of the ESC will reduce the amount of "punch" it provides but won't inhibit top speed. This feature is also found on LRP's top-of-the-line Quantum Competition ESC.



trigger at neutral, again with the trigger at neutral and a third time with the trigger at full brake.

PLUG-IN INSTALLATION. The Quantum has a Tamiya-style battery plug and bullet motor connectors, and motor capacitors and a Schottky diode are also included.

MOD-MOTOR FRIENDLY. According to LRP, the Super Sport can handle modified motors down to 12 turns. That's enough motor for most vehicles on most tracks and more than enough for play.

STICK-ON HEAT SINK. LRP includes an attractive heat sink for the Super Sport. It's only needed if you plan to frequently run the ESC near its operating limits, but the blue-anodized heat sink looks so trick with its etched LRP logo that you might want to stick it on just for style!



SHORT-CIRCUIT AND THERMAL-OVERLOAD PROTECTION. When the Quantum senses a short circuit, overload, or overheating, the thermal protection feature automatically kicks in and shuts down the ESC; bright red and green LEDs flash to alert you. After the unit has cooled down, throttle control comes back automatically.

PUSH-BUTTON SETUP. LRP ESCs use a "confirmation" setup procedure; the setup button is pressed once with the

FINAL CALL
The Tamiya plug and bullet connectors say "play," but this ESC is built to race.

LRP; distributed by Team Associated (714) 850-9342; www.teamassociated.com.

MANUFACTURER'S SPECIFICATIONS

LRP Quantum Sport ESC

Price*	\$130
Case size	25.4x23.1x16mm
Weight	15g (excluding wires)
Input voltage	4 to 6 cells
On resistance	0.00098 ohm
Frequency	2300Hz
Motor limit	12 turns
Overload protection	Thermal
Battery plug	Tamiya
Motor plug	Bullet
Receiver plug	Universal
Setup	Push-button

*Price varies with dealer

TESTING

The Super Sport was tested in a Team Associated Team Built RC10T3 equipped with a Fantom Team rebuildable stock motor. Installation was a two-minute plug-it-in-and-stick-it-down affair plus an additional 10 seconds for the push-button setup. It doesn't get much easier!

On the track, the Super Sport provided excellent control. With the APC control "off" (set for maximum punch), there was plenty of power with a nice linear feel at the trigger. To help cope with a slippery track surface or itchy trigger finger, you can dial up the setting. With the APC set for maximum "limiting," the Super Sport launched the T3 more gently than any track is likely to warrant (unless it's ice), and punch increased progressively as the APC was dialed out. It was easy to find just the right setting for a powerful launch without wheelspin, and top speed was never affected by the APC setting. In addition to helping with "driveability," the APC can help extend run time.

Braking was also a strong point for the Super Sport. Wheel-locking power is nice (and not hard to achieve with a stock motor), but brake control is much more important than sheer stopping power. The Super Sport's brakes had a very precise, easy-to-modulate feel.

The Super Sport appears to be durable; during 12 runs over dirt and pavement, there were no performance glitches, and the unit was only slightly warm. ■

Start your Engine on the First Pull!

by Peter Vieira

It's a fact of nitro life: sooner or later, your engine won't want to start or stay running long enough for you to get up on the drivers' stand. Don't shelve your piston-pounder and start charging batteries just yet; hard-starting woes aren't usually tough to fix. Follow these steps, and you'll reach nitro nirvana again in no time.



Got pinch?

Before we start troubleshooting, let's first make sure the

piston and sleeve aren't toast. Remove the engine's glow plug, and rotate the flywheel with your finger. As the piston reaches top dead center, you should at least feel resistance as the piston is "pinched" by the sleeve. This tight fit seals the combustion chamber and is critical to engine performance. If you don't feel any pinch, you probably need to replace your piston and sleeve.

You don't have to disassemble your engine to check the sleeve's "pinch," but this illustrates what you're feeling for: resistance as the piston reaches the top of the sleeve.



Use a screwdriver to keep pressure on the pull-starter's spring so it doesn't uncoil as you remove the assembly.

Keep your glow-starter's contacts as clean as possible, and make sure the battery is fresh (or fully charged).



If your glow plugs don't light brightly, replace them. Stick with high-quality name-brand plugs, such as these from Fox.

Check out the glow system

Even rank novices know to check out the glow plug when starting problems occur, but few remember to check the other half of the glow system—the glow starter! Make sure that your glow starter is fully charged (or has a fresh battery), and its contacts are clean. Press the glow plug into the glow starter and watch the coil; it should almost instantly glow bright orange, and the entire coil should glow. If the coil glows dull red, or it doesn't glow at all (and you're certain the glow starter is charged and making good contact), you need a new plug.

If you have an electric starting system, the testing procedure is the same, but you must remember to touch the glow plug to the heat-sink head as you crank the engine; if you don't, the glow plug won't light because the circuit is incomplete.

Do the tighten-up

Make sure that the engine's heat-sink head and backplate screws are fully tightened. Cinch them down in the pattern shown to ensure even tightness; if you torque the screws down completely one at a time, you'll warp the parts and prevent them from sealing properly against the engine. Pull-start engines require the starter housing to be removed for backplate access; be careful not to uncoil the starter spring in the process! Slip a screwdriver between the backplate and housing to prevent the spring from popping out, then tape or rubber-band the assembly after removal so it doesn't go "boing!" on your bench.

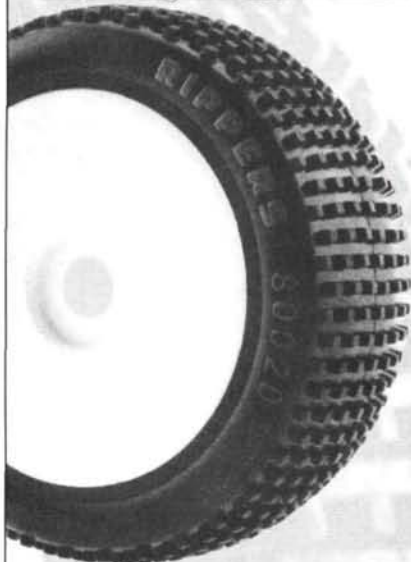


Tighten the heat-sink head and backplate screws in a crisscross pattern to ensure even tightness.



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HOW TO START YOUR ENGINE ON THE FIRST PULL!



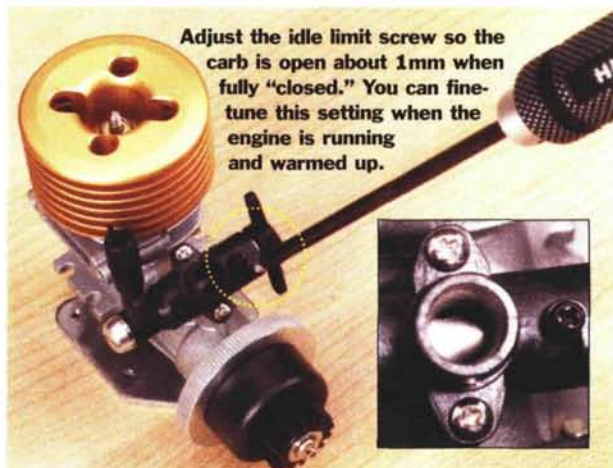
Speaking of sealing ...

While you're wrenching, take a look at the gaskets or O-rings that seal the carburetor base and backplate. If they're damaged, replace them. A coat of Permatex Ultra Copper sealant (or similar sensor-safe automotive sealant) is also good insurance against air leaks.

Don't go crazy with the goo; more isn't better.

Know your limits

If your engine seems to start easily enough but shuts down as soon as you let off the gas, check your idle-limit screw—the little guy just in front of the carburetor opening. Turn the screw so the carb still has a 1mm (or so) opening when full brake is applied. If the screw turns very easily, put a drop of thread-lock on it to prevent engine vibration from causing the setting to drift.



Adjust the idle limit screw so the carb is open about 1mm when fully "closed." You can fine-tune this setting when the engine is running and warmed up.



High-end needle



Low-end needle

Needle needs

If you went nuts with your carb's needle settings before your starting troubles began, you should reset them to factory specs. Lost your manual? For most engines, a good starting setup is "flush" for the low-end needle (adjust the needle so its screw head is level with the opening in the carb body the screw

head sits in), and "two turns out" for the high-end needle (gently turn the needle clockwise until it bottoms out, then give it two full counterclockwise turns).



How's that fuel tubing?

Even tiny pinhole leaks in your vehicle's fuel and pressure lines can cause erratic engine operation and starting difficulties. When in doubt, replace the fuel tubing; it's inexpensive, and with all the color options available, it's a cheap and easy way to give the chassis a new look.

General Silicones is the fuel-tubing kingpin; you can buy their tubing in lengths or by the roll.

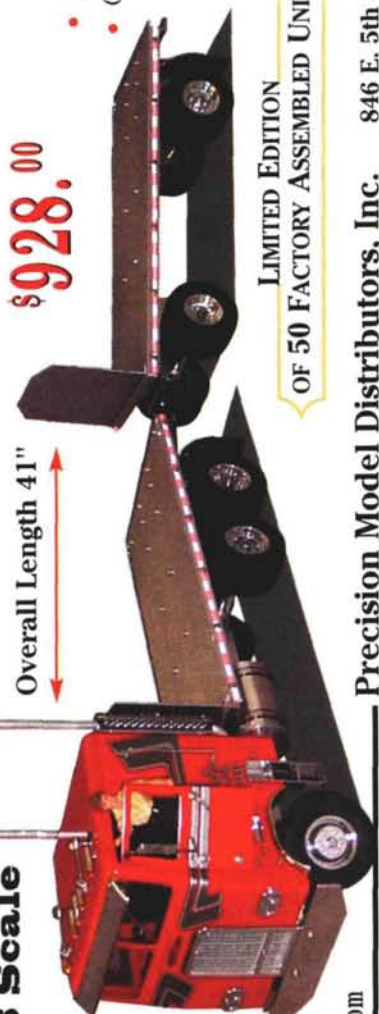
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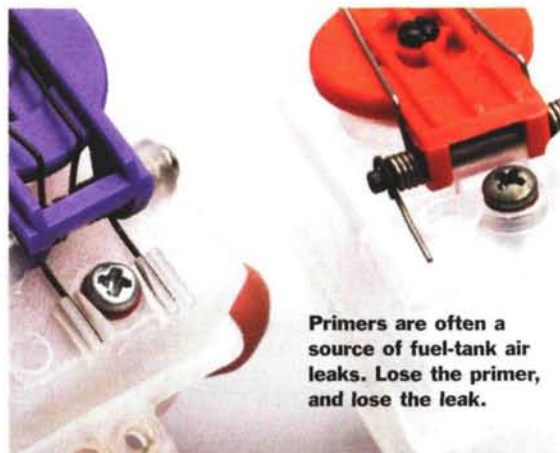
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HOW TO START YOUR ENGINE ON THE FIRST PULL! *continued from page 226*

Tanks for the memories

Your fuel tank isn't clogged, is it? Look for any crud in the tank where the fuel pickup line is, and get it out of there. Likewise, you should check your vehicle's in-line fuel filter (if so equipped) frequently; it can become clogged with debris and impede fuel flow if not cleaned regularly. Finally, consider removing the tank's plunger-type primer, if so equipped; such primers are prone to air leaks. After you've removed the primer, fill the hole with a machine-thread screw and some silicone sealant.



Primers are often a source of fuel-tank air leaks. Lose the primer, and lose the leak.



Freshen up your fuel

If your jug of fuel spent the winter on the garage floor, it has probably gone bad. Very bad. Dispose of it responsibly, and get yourself a new gallon. Store it in a cool, dry place away from sunlight and off the floor. If you like to race outside or go on extended-play missions outdoors, try to keep your fuel out of the sun and heat. Trinity's Nitro Kooler bags are the best way to prevent solar heating and protect fuel in clear containers from light exposure.

Here is an actual photograph of fuel going bad. The rake, on the other hand, is doing fine.

Start!

Now that you've ironed out any potential problems, you're ready for a first-pull startup.

Here's how to make it happen:

- 1** Prime the carburetor. Remove the pressure line from the exhaust pipe, and blow into it; you'll see a solid jet of fuel fill the fuel line up to the carburetor. When the fuel hits the carb, stop blowing. Reinstall the pressure line.
- 2** Install the glow igniter. If it's a cam-lock type, make sure it's secure. Is there a gauge on top? Make sure the needle is in the green.
- 3** Crack the throttle. Instead of triggering the radio, just turn the throttle-trim knob to open the carb another 1/2 millimeter or so.
- 4** Pull the starter cord! Give a sharp tug, and your engine should now be running. At the very least, it should pop on the first pull and start on the second or third (the extra tugs are usually only required if the carb wasn't fully primed).

Now get out there and tear it up! ■

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Mobile Miniature Speedway, Theodore, Alabama 36582; Richard Sweetser, 866-653-6643 or 251-653-6643; email: hurricane.71@gateway.net



North Cullman Raceway, Cullman, Alabama 35058; Daniel Lollies, 256-775-2491; email: cullmanrchoobbies@yahoo.com; web: www.cullmanrchoobbies.homestead.com

Oak Mtn R/C Raceway, Columbiana, Alabama 35051; Matthew Gordon, (205)669-6837; email: oakmntnrcraceway@hotmail.com



Phoenix Raceway & Hobby, Phoenix City, Alabama 36867; Chris Watson, 334-298-9200; email: phoenixhobbies@hotmail.com

Spring Cove International Speedway, Florence, Alabama 256-757-1562; email: rvines@hiway.net; web: www.springcovespeedway.com/SpringCove.htm



ARIZONA

Hobby Town Raceway, Scottsdale, Arizona 85251, (602) 948-3946



HobbyTown Mountain Raceway, Flagstaff, Arizona 86004; Richard, (520) 214-9887



HobbyTown Raceway, Tucson, Arizona 85704, (520) 882-8888



HobbyTown U.S.A., Phoenix, Arizona 85044; Linda McFarland, (480) 598-5282



R/C Sports Mania, Phoenix, Arizona 85017; Gary Dick, (602) 278-3671



Scottsdale R/C Raceway, Scottsdale, Arizona 85251; Scott Anfinson, 480-945-2186



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Hobby Town USA, Fayetteville, Arkansas 72703; Darrell Irvin, (501) 571-3730



Sparks R.C. Raceway, Paragould, Arkansas 72450; Tommy Sparks, (870) 239-3606



CALIFORNIA

Bear Valley Super Speed Way, Tehachapi, California 93561; Mike Zanghi, 661-821-4100; email: three-zs@csurfers.net



California R/C Raceway, Anaheim, California 92806; Brad or Taka, (714) 630-9340



Capital City R/C Center, Sacramento, California 95829, 916-383-3445; web: www.capitalcityrc.com



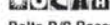
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CCRCCC, California City, California 93505; Josh Geiger, (760)373-2537; email: gorace@ccis.com



Crystal Park Raceway, Compton, California 90202-4925; James Reese, 310-631-0307; email: mailto:info@crystalparkraceway.com



Delta R/C Raceway & Hobbyshop, Antioch, California 94509; Jerry, (925) 778-2965; web: www.deltarc.com



Extreme RPM Hobbies, Grand Terrace, California 92313; Bobby Haney, 909-370-3379; email: Extremerrpmrace@aol.com; web: www.ExtremeRpmRacing.com



Fastrax, Ridgecrest, California; Danny Quinn, (760) 377-1193; email: webmaster@fastrax.com; web: www.fastrax.com



Grams Raceway, Willits, California 95490; Nathan Long or Mark Long, 707-459-1275; email: nate_racer@yahoo.com



Hobby Central Raceway, Poway, California 92064; Lee, (858) 513-0373; web: www.hobby101.com



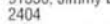
Hobby World, San Jose, California 95129; Guy Bassett, (408) 873-2109



HobbyTown Raceway, Fresno, California 93711; John Toews, 559-435-3342; email: rcfast@mediaone.net



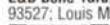
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R.O.C.K.S. (Radio Operated Car Klub of Solano), Fairfield, California 94533; Mike Learn, (707) 447-0492



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Sacramento RC Racing & Hobbies, Sacramento, California 95824; Andreas Muller, (916) 424-4001; email: andreas123@earthlink.net; web: www.77sunset.com



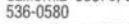
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Sonora R/C Raceway, Sonora, California 95370; Jeff Amos, (209) 536-0580



SpeedWorld Raceway, Roseville, California 95678; Billy Bowerman, 916-783-8864; email: speeddog@mindsync.com; web: speedworldraceway.com

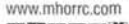


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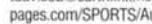


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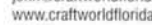
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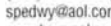
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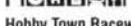


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Radio Control Assoc./Alaa Park Raceway, Pearl City, Hawaii 96782; Ace R/C Products, (808) 456-1279



Sandy Flemings, Pearl City, Hawaii 96782; Dave Caldwell, 808-456-7272; email: info@formula1-rc.com; web: www.formula1-rc.com



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Pocatello Extreme Race Way, Pocatello, Idaho 83201; Anthony Stewart, 208-233-8163; email: dapco-hobbies@yahoo.com



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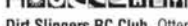


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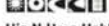
AJs Raceway & Hobby, Dekalb, Illinois 60115; AJ, 815-756-2772; web: www.ajsraceway.com



C.I.R.C.A., Jacksonville, Illinois 62650; Sport en 'Hobby, (217) 245-1375



Dirt Slingers RC Club, Otterville, Illinois 62052; Valerie Dellenbach, 217-942-6891; email: dirtslingers@hotmail.com; web: www.dirtslingers.org



His N Hers Hobbies Raceway, Bloomington, Illinois 61701; Kevin Turek, 309-827-0204; email: hisnher-hobbies@aol.com



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Monroe R/C Raceway, Monroe, Illinois 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597 (office)



Primetime Hobbies, Tremont, Illinois 61568; Don Davis, 309-925-9999; email: staff@primetimehobbies.com; web: www.primetimehobbies.com



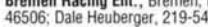
R/C Raceway, Palatine, Illinois 60067; Jamie Pauls, 847-612-3140; email: jamie@sharingideas.com; web: www.sharingideas.com



Radio-Active Raceway, Bolingbrook, Illinois 60440; Jim, (630) 759-7557

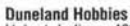


Venture Raceways, Libertyville, Illinois 60048, (847) 549-6963



INDIANA

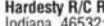
Bremen Racing Ent., Bremen, Indiana 46506; Dale Heuberger, 219-546-3807



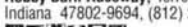
Duneland Hobbies & Raceway, Hobart, Indiana 46368; Ron, 219-945-1239; email: RTrobaugh1@email.msn.com; web: www.dunelandhobbies.com



GM Raceway, Elkhart, Indiana 46516; Pete Russell, 219-293-1827



Hardesty R/C Raceway, Hamlet, Indiana 46532; Max Hardesty, (219) 867-8600



Hobbytown U.S.A., Indianapolis, Indiana 46250; Sonny Brown, (317) 845-4106; email: trackinfo@hobbytownindy.com; web: www.hobbytown-indy.com



Madison Fun Wheelers, Madison, Indiana 47250; Charles McCormick, 812-265-4576; email: chatchel@seida-ta.com



P&T Hobbies and Raceway, Mitchell, Indiana 47446; Paul Weber or Tom Logsdon, (812) 849-6666; email: pthobby@iquest.net; web: www.pthobby.com



Pete Russell's R/C Speedway, Elkhart, Indiana 46516; Pete Russell, 219-293-1827



R/C World of Indiana, Lynn, Indiana 47355; Joe Kolp, (765) 874-2464; email: rcworldofindiana.com; web: www.RCWORLD.com



RC Barn, Monroe, Indiana 46772; Mark Lengerich, (219) 692-6600; email: bigdaddy@adamswells.com; web: www.rcbarn.com



Schoolyard RC Speedway, Lagrange, Indiana 46761; David W. Bryan, 219/463-3598; email: dwbryan@loci.net



Showtime Lot Racing, Fort Wayne, Indiana 46819; Mike Romines, (219) 478-6099; web: fortwaynecrpark.tripod.com/



IOWA

Ames Radio Control Speed Assoc., Ames, Iowa 50014; Ryan Davis/Brad Scandrett, 515-231-3813/515-432-0467; email: Davismotorsp@aol.com



Delb's Speedway, Clinton, Iowa 52732; Rusti's Miniatures and Hobbies, (319) 243-2697



Dubuque R/C Speedway, Dubuque, Iowa 52001; Paul Conlon, (319) 556-2736



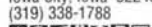
Hobby Haven, Des Moines, Iowa 50322; Rick Marble, (515) 276-8785; web: www.hobbyhaven.com



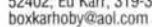
Independence, Independence, Iowa 50644; Eugene Bachman, 319-266-3857; email: BachmanE2@hotmail.com



Inside Challenge, Keokuk, Iowa; Jessie, (319) 524-2225



Iowa City R/C Racing Association, Iowa City, Iowa 52240; Hobby Corner, (319) 338-1788



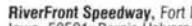
IROAR-Vinton Raceway @ Vinton Roller Rink, Cedar Rapids, Iowa 52402; Ed Karr, 319-362-1291; email: boxkarhobby@aol.com



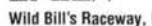
Manly R/C Club, Manly, Iowa 50456; Bruce Hill, (641) 454-2025



Marble's Raceway, Des Moines, Iowa 50317; Rick Marble, (515) 262-7507



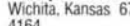
Radio Control Raceway Park, Fort Dodge, Iowa 50501; Bernie Halverson, 515-576-3780; email: bhalverson@dodgenet.com



RiverFront Speedway, Fort Dodge, Iowa 50501; Bernie Halverson, 515-576-3780 (515-571-1717 Race Day); email: bhalverson@dodgenet.com

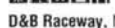


Wild Bill's Raceway, Knoxville, Iowa 50138; William Anderson, Jr., 641-842-5973; email: wildbiz@iowatelecom.net; web: www.wildbillsracing.com



KANSAS

Air Capital Hobbies Raceway, Wichita, Kansas 67212, (316) 721-4164



D&B Raceway, Menlo, Kansas; Ron Ball, (785) 855-2370



KENTUCKY

Coyote Run Raceway, Lexington, Kentucky 40507; Paul Purcell, 859-253-9330; email: coyoterace1@hotmail.com; web: fullspeedto/coyoterun-raceway/



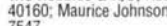
Dixon's R/C RaceWay, Hazard, Kentucky 41701; Jeff Dixon, (606) 436-4820; email: jeffdr1@hotmail.com



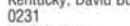
Mayking R/C Speedway, Mayking, Kentucky 41837; Jon Fields, 606-633-4700; email: jon1@se-tel.com



Pit Stop Hobbies, Paducah, Kentucky 42003; Robert or Rodney, 270-443-0052; email: pitstop1@apex.net



Trio Hobbies & R/C, Radcliff, Kentucky 40160; Maurice Johnson, (502) 351-7547



Wildcat Speedway, Nicholasville, Kentucky; David Bowles, 859-272-0231



LOUISIANA

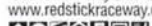
Fast Pace Hobbies, Alexandria, Louisiana 71301; Joseph or Casey Toralba, 318-561-2070; email: fast-pacehobbies@aol.com



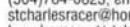
Gator R/C Raceway, Moss Bluff, Louisiana 70612; Tony Diaz, 337-855-3206; email: keithsja@aol.com; web: homepage.mac.com/knaples/



Red Stick R/C Raceway, Baton Rouge, Louisiana 70814; Michael Pino, 225-218-1002; email: redstickraceway@aol.com; web: www.redstickraceway.com



St. Charles RC Speedway, Destrehan, Louisiana 70047; Al Cazalot, (504) 764-0625; email: stcharlesracer@home.com; web: members.home.net/stcharlesracer



MAINE

Central Maine R/C Speedway & Hobbies, Fairfield, Maine 04963; David Prescott, (207) 453-4588; email: rrcracer@mint.net



Clay Bowl R/C Hobbies, Greene, Maine 04236; Pat Cap, (207) 946-5003



MARYLAND

Coles Race Way, Waldorf, Maryland 20602; Cole Brincefield, (301) 843-1386; email: kbrincefield@cs.com



GPA Hobbies, Crofton, Maryland 21114, (301) 858-0004



The Track, Gaithersburg, Maryland 20877; Mimi Wong, (301) 417-9630; email: mimithe-track@yahoo.com; web: www.rctrack.com



MASSACHUSETTS

Big Boys Toys, Fall River, Massachusetts 02723; Track Owner, 508-677-9400



East Templeton Model Raceway, Templeton, Massachusetts 01468; Keith Anderson, 1-978-632-1619; email: keith@glowplug.com; web: glowplug.com



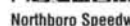
Everett Raceway, Everett, MA, Massachusetts 02149-1700; Luangel Perez, 781-929-3604; email: elka-bong13@yahoo.com



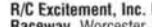
Hi-Tech Hobbies, Raynham, Massachusetts; Ruben, (508) 880-5373



Megadrome Raceway, North Adams, Massachusetts 01247; Bob Blanchette, 413-743-7223



Northboro Speedway, Northboro, Massachusetts 01532; Bob Trimble, 508-393-8087 or 393-2691



R/C Excitement, Inc. Hobby & Raceway, Worcester, Massachusetts 01605; Mike Gordon, 508-753-8676; email: rcexcitement@aol.com; web: www.rcexcitement.com



RPM RC Raceway, Abington, Massachusetts 02351-1094; Richard Tonetti, (781) 857-2300; email: hobtown@AOL.com; web: www.rpmhobbies.com



MICHIGAN

Backyard R/C Raceway, Brown City, Michigan 48416; Tom Jones, (810) 793-0257; email: JONES_TNT_2000@YAHOO.COM



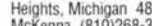
D.R. R/C, Taylor, Michigan 48180; Bobby or Fred, (734) 287-7405; web: www.downriverracing.8k.com



E.U.P., Kincheloe, Michigan 49788; Joel Wiggins, 906-495-3503



Fastraxx, Brownstown, Michigan 48873; Greg Yingling, (734) 379-8980; email: fast3@hotmail.com



Freedom Hill R/C Raceway, Sterling Heights, Michigan 48312; Jim McKenna, (810) 268-3996



Hideaway Raceway, Napoleon, Michigan 49201; David Carlisle, 1-517-536-8821; email: adcarlisle1@netscape.net

Jons Hobby, Mt. Pleasant, Michigan 48858; Jon Beutler, (517)773-5412; email: jonshobby@earthlink.net; web: www.jonshobby.com

JT Superspeedway, Battle Creek, Michigan 49015; Jerry or Sam, 616-965-0116

Larrys Performance R/Cs, Commerce, Michigan 48390; Jess or Oppie, 248-926-1140; email: lprcs@qwest.net

Lazer RC Speedway, Adrian, Michigan 49221; Russ Johnson, (517) 263-2806

N.M.R.C.C. Raceway, Gaylord, Michigan 49735; Gabe, (517) 732-3963; email: hobby-toy@voyager.net

R&L Hobbies & Racing, Portage, Michigan 49002; Rex Simpson, (616) 323-3686; web: www.rlhobbies.com

R.A.C.E. Inc., Jackson, Michigan 49203; Sam Sprang, (517) 787-9161

Raw Roots Race Tracks, West Olive, Michigan 49460; Roy Bennink, (616) 399-9338

Village Hobbies, Hesperia, Michigan 49421; John Fosdick, 231-854-1374; email: vhracing@triton.net

Village R/C Raceway, Decatur, Michigan 49045; Chuck Nolke, (616) 423-7878

Washtenaw R/C Raceway, Ann Arbor, Michigan 48103; Jim Rousseau, 734-395-5048

MINNESOTA

Bruce McCullough Memorial R/C Speedway, Cloquet, Minnesota; Howie Port, (218) 879-5174; email: port.hole@mcw-world.com

Country R/C Raceway Park, Belview, Minnesota 56214-8115; Charles L. Steffi, 507-641-8115

J's Radio Control Race Park, Starbuck, Minnesota 56381; Jay Campbell, (320) 239-4827

Kevin's Off-Road Raceway, Crookston, Minnesota 55432; Steve Hedenland, 763-571-9283; email: mrtip@national-hobby.com; web: www.nationalhobby.com

National Speedway, Fridley, Minnesota 55432; Steve Hedenland, 763-571-9283; email: mrtip@national-hobby.com; web: www.nationalhobby.com

Northwoods Hobby Raceway, Brainerd, Minnesota 56401; John or Doug, (218) 829-9257

Twin Cities Hobby & Raceway, Brooklyn Park, Minnesota 55443; Mark O'Brien, 763-569-5069; email: wooduster@msn.com; web: www.twincityhobby.com

MISSISSIPPI

Meridian RC Speedway, Meridian, Mississippi 39302; Joe or Pearce, 601-483-7000

Small Cars Unlimited, Jackson, Mississippi 39212; Ed Hill, 601-372-3278; email: fast@smallcarsunlimited.com; web: www.smallcarsunlimited.com

MISSISSIPPI

Meridian RC Speedway, Meridian, Mississippi 39302; Joe or Pearce, 601-483-7000

Small Cars Unlimited, Jackson, Mississippi 39212; Ed Hill, 601-372-3278; email: fast@smallcarsunlimited.com; web: www.smallcarsunlimited.com

MISSISSIPPI

X-Treme RC, Saucier, Mississippi 39574; Marty Capers, (228) 539-2004

MISSOURI

B&L Hobbies & Raceway, Park Hills, Missouri 63061; Bob Marler, (573) 431-9444

Hobbies in Motion Raceway, Springfield, Missouri 65803; Matthew Froning, 417-886-9621; email: MRKID-TURISMO@AOL.com; web: rccars.guildhappy.com

North Missouri Raceway, Chillicothe, Missouri 64601; Billy Johnston, (660) 646-1120

Novelty R/C Raceway & Hobbies, Novelty, Missouri 63460; Rex & Jena Franke, 660-739-4530; email: rex_jena@noveltyrc.com; web: www.noveltyrc.com

Ozarks R/C Raceway, Springfield, Missouri 65803; Gene Rhodes, 417-873-9350 (Track), 417-742-4376 (Home); email: OzarksRaceway@aol.com

RCTRAX Racing Club of Central Missouri, Hallsville, Missouri 65255; Gary Phillippe, 573-886-3799 or 573-442-8183; email: gary.phillippe@verizon.com

Real Blue Vue R/C, Kansas City, Missouri 64133; Steve Hale, (816) 358-0238; email: hrealrc@aol.com; web: www.geocities.com/real_rc_raceway

Real R/C Raceway, Pleasant Hill, Missouri 64080; Steve Hale, (816) 540-5584; email: hrealrc@aol.com; web: www.geocities.com/real_rc_raceway

Showtime Speedway, Bakersfield, Missouri; Don Risner, (601) 203-1481

NEBRASKA

Hadar R/C Raceway, Norfolk, Nebraska 68701; John Schoenauer, (402) 644-7922

Hobby Town Raceway, Lincoln, Nebraska 68505; Chris or Chad, 402-434-5056; email: eaststore@aol.com

Hobby Town USA Raceway Park, Lincoln, Nebraska 68508; Chad or Chris, 402-434-5056; email: eaststore@aol.com

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T-Rix bikes & R-C shop, Elko, Nevada 89801; Gary Perkins, (775)777-8804; email: MTNMAN14K@HotMail.com; web: N/A

NEW HAMPSHIRE

Lakes Region R/C Speedway, Gilford, New Hampshire 03246; Louie Blais, 603-524-2909; email: lakeregionrc@homestead.com; web: www.lakesregionrc.homestead.com/home.html

RT 106 Racepark, Pembroke, New Hampshire 03275; David Daniels, 603-224-7223; email: david@collectracing.com; web: www.106racepark.com

NEW JERSEY

America's Hobby Center Inc., North Bergen, New Jersey 07047; John Many, (201) 662-0777; web: www.ahc1931.com

Checkerboard Raceways, Elwood, New Jersey 08217; Ray Murray, 856-629-9413; email: RaysTrack@webtv.net

Family Hobbies Raceway, Vineland, New Jersey 08360; Linda Vogel, 856-696-5790

Jackson RC Club, Jackson, New Jersey 08527; Al Sardano, 732-364-6422; email: Tazzyd@optonline.net; web: www.jacksonRC.com

Jefferson Speedway, Oak Ridge, New Jersey 07438; Mike, (201) 697-7525

Millville R/C Oval & Roadcourse, Millville, New Jersey 08332; William Denstoz, 856-327-4640

On Trax Hobbies, Browns Mills, New Jersey 08015; Joseph DiGirolamo, (609) 735-0422

PottBellys R/C Speedway, Vineland, New Jersey 08360; Drew Anastasio, 856-875-2132; email: PottBellys_rc@yahoo.com; web: www.geocities.com/pottbellyrc

South Jersey Cost Controlled Racing, Sicklerville, New Jersey 08081; Ray Murray, 856-629-9413; email: RaysTrack@webtv.net; web: community.webtv.net/RaysTrack/SouthJerseyCost

SpeedPro Dragway, Elizabeth, New Jersey 07206; Albie Nizolek, 908-351-5080; email: funnycar176@aol.com; web: www.speedpro.org

The Race Place, Farmingdale, New Jersey 07731; John Fary, (908) 938-5215

Wacky RC Raceway, Roselle, New Jersey 07203; Tony Williams or Kimble Wright, (908) 241-6700

NEW MEXICO

Albuquerque R/C Off-Road Raceway, Albuquerque, New Mexico 87120; Bill Mitchell, (505)243-0681(W); 898-6181(H); email: email-bill@home.com

Big Boys Toys Raceway, Albuquerque, New Mexico 87112; Isaac Garcia, 505-298-1023; email: yoklosi@aol.com; web: www.bigboytoys.theshoppe.com

BarnStormers Speedway, Chester, New York 10918; Lou, 845-469-6468; email: iamsysma@hotmail.com; web: www.barnstormers.virtualave.net

Brennan's RC Hobbies, Vernon, New York; Bill or Tom Brennan, (315) 829-4930

NEW YORK

Brooklyn Hobbies, Brooklyn, New York 11234; Chris Palermo, 718-951-2500; email: brooklynhobbies@aol.com; web: www.brooklynhobbies.com

Bruckner Racing, Bronx, New York 10465; Thomas Baffers Sr., (800)-288-8185

C&C Speedway, Binghamton, New York 13903; Eric Boyd, (607) 773-2044

Capital District Radio Controlled Stock Car Club, Loudonville, New York 12211; Peter Willis, (518) 482-7128; email: rcpete12211@yahoo.com; web: cdrcscc@homestead.com

Chipmunk Hill R/C Speedway, Theresa, New York 13691; Ted or Pete House, (315) 628-5065

Competition Hobby, Cohoes, New York 12047; Howie Cummings, 518-786-3622; email: hic300@aol.com

East Coast R/C Hobbies, Brooklyn, New York 11204; John Giangrande, 718-627-3814

Fastraks, Hogsburg, New York 13655; Mark Castonguay, (518) 358-3686; email: froghobbs@northnet.org; web: www.fastraks.8m.com

Hobby Zone Raceway, Ozone Park, New York 11417; BRIAN, SEAN, OR ADAM, (718)641-9001; email: moonchaserwolf@aol.com

Lil Wheels Raceway, Oswego, New York 13126; Bill Meyer, 343-6566; email: lilwheelsraceway@hotmail.com; web: lilwheelsraceway.tsx.org

Long Island Raceway, Farmingdale, New York 11735; James, (516) 845-7223; web: www.raceway.com

MTW Raceway, Cato, New York 13033; Tim, 888-39-HOBBY; 315-626-2029; email: docsavage@mtwraceway.com; web: www.mtwraceway.com

PRO Speedway, Cattaraugus, New York 14719; Marc Pritchard, (716) 257-3101

Radio Hill Raceway, Dundee, New York 14837; Bill or Greg, 607-243-8641 (Bill); 607-243-7899 (Greg)

Rampage R/C & Hobbies, Hyde Park, New York 12538; Brian Walker, (845) 229-1379

South Shore Hobby & Raceway, Patchogue, New York 11772; Benny or Bonnie, 631-758-5567; web: www.southshorehobby.com

Southern Tier Raceway, Owego, New York 13827; Anita Harding, (607) 687-5395

TARMAC Ultimate R/C Raceways, Poughkeepsie, New York 12603; Todd Plass, 845-342-5409 (Todd); 845-454-8276 (Track-Sundays); email: toddp@tarmacraceway.com; web: www.tarmacraceway.com

Wall's Hobby, Syracuse, New York 13209; Bruce, 315-453-2291; web: www.walls-hobby.com

Willis Hobbies R/C Speedway, Mineola, New York 11501; Ken Ford, 516-746-3944; web: www.willishobbies.com

NORTH CAROLINA

Chapel Hill RC Assoc./Hungates RC Racing, Chapel Hill, North Carolina 27514; Tom Gabriel, 919-933-7671; email: chapelhillrc@yahoo.com; web: www.chapelhillrc.com

Chatham R/C Raceway, Bear Creek, North Carolina 27207; Dwight Fields, (919) 898-4518; email: chatham_rc_speedway@yahoo.com; web: www.chathamrcspeedway.com

R.C.R. Speedway, Salisbury, North Carolina 28147; Ronnie Linker, (704) 637-2565

Race City Motor Speedway, Mooresville, North Carolina 28115; Ray Kelly, 704-660-FAST; email: Kellyrcms@cs.com; web: racecitymotorspeedway.com

Rosewood RC Speedway, Goldsboro, North Carolina 27530; Glenn Elam, 919-731-4734

Sandhills Raceway, Southern Pines, North Carolina; Mike Russel, 910-245-4450; email: mrmrc@mindspring.com; web: www.sandhillsraceway.com

Southern RC Motorsports Club, Shalotte, North Carolina 28459; Eddie Ferrell, (910) 754-8528

The Antique Barn, Wilson, North Carolina 27893; Steve, (252) 237-6778; email: antiquebarn@esn.net

NORTH DAKOTA

Grand Forks Remote Control Racers, Grand Forks, North Dakota 58201; Dan Miller, 701-746-9910; email: dand-miller@junco.com; web: mule.puah.org/gtrcr

OHIO

AK Hobby & Raceway, Cincinnati, Ohio 45211; Tim Tolle, (513) 661-7080; email: tim@akhobby.com; web: www.akhobby.com

American Ohio Sprint Car, Wickliffe, Ohio 44092; Gary Waldhelm, 440-944-9966; web: www.aosca.8m.com

Black Swamp RC Car Club, Toledo, Ohio 43623; Riders Hobbies, 419-843-2931; email: ridersrcclub@webtv.net; web: www.blackswamptrc.cb.net

KEY TO SYMBOLS

Indoor

Outdoor

Off-road

On-road

Oval

Dirt oval

Carpet

Concrete

Asphalt

Minis & Micros

On-site hobby shop

AC power

Auto lap counting

Food available

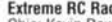
CORCAR / Sams Club, Galloway, Ohio 43119-8732; Bill Stevenson, (614) 870-7159



D&J R/C Raceway, Orrville, Ohio 44667; Don, (330) 682-4266



DeFosse Raceway, Ripley, Ohio; Greg DeFosse, (937) 377-2063



Extreme RC Raceway, Wheelersburg, Ohio; Kevin Rowe, (740) 574-4190; email: extremerc2000@yahoo.com; web: www.ohioxrc.com



Hobbyland Raceway, Proctorville, Ohio 45669; Craig Harber, 740-886-0502 or 740-8868062; email: pitrow-eracing@webtv.net; web: hobbyland-raceway.homestead.com



Medina R/C Raceway, Medina, Ohio 44256; Mr. Bill, (330) 723-0255; email: mr.bill@nls.net



Mid Ohio Dirt Oval, Lexington, Ohio 44904; D&D Hobby Center, (419) 884-0001



Nothing But Air R.C. Track, Logan, Ohio 43138; Gary Lloyd, 740-385-0288



Ohio Valley OffRoad R/C Raceway, Jerusalem, Ohio 43747; Kevin Wilson, (740) 926-1738; email: consolo1st.net; web: www.ovor8M.com



Outlaw Speedway, Lexington, Ohio; Eric Radio, 419-884-0001; email: kramerjo@aol.com; web: rcdirtoval.freesevers.com



Riders R/C Club, Toledo, Ohio 46825; contact store, (419)-843-2931; email: Ridersrcclub@webtv.net; web: www.ridersrcclub.cjb.net



River Rat Racing, Ripley, Ohio 45167; Jon Faris, 937-392-9298; email: honey3@bright.net; web: www.riverrat-raceway (under construction)



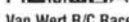
T.S.R.C.A.R., Hamilton, Ohio 45011; Dennis Young, (513) 367-5634; email: scalercar@aol.com; web: www.tri-staterautoracers.com



TARCAR, Toledo, Ohio 43617; Bill Bridges, (419) 826-3859



Ultra Racing R/C Hobby and Track, Hamilton, Ohio 45015; Ed Lewis, 513-863-7342; email: UltraRacing@aol.com; web: www.rcaronline.com



Van Wert R/C Raceway, Van Wert, Ohio 45891; Mark Davis, (419) 232-2112



Y-City Hobby & Speedway, Zanesville, Ohio 43701; Kevin McKenna, (740) 455-3025; email: Kevin@ycity-hobby.com; web: www.ycityhobby.com

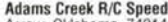


OKLAHOMA

Action Hobbies, Tulsa, Oklahoma 74145; David Cole, (918) 6638998; email: acthobbi@aol.com



Action RC Speedway, Oklahoma City, Oklahoma 73135; Jerry Hawthorne, (405) 670-7770; email: gimna@flash.net; web: www.actionrc.com



Adams Creek R/C Speedway, Broken Arrow, Oklahoma 74014; John Beighle, (918) 355-1416



Competition R/C, Oklahoma City, Oklahoma 73149; James or Louise Brown, (405) 634-0809; email: com-prc1@aol.com



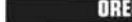
Enid R/C Speedway, Enid, Oklahoma 73703; Darin Pendleton, (580) 554-9400; email: darin@enidrc.com; web: www.enidrcracing.com



HobbyTown USA, Norman, Oklahoma 73072; Todd Jensen, (405) 292-5850



Wings N Things Raceway, Tulsa, Oklahoma 74105; Heath Anderson, (918) 745-0007



OREGON

Competition Racing Association, Portland, Oregon 97230; Mark Taylor, (503) 761-1334; email: crajodi@qwest.net or cramark@qwest.net; web: home.attbi.com/~cra/



Dirt City RC, Albany, Oregon 97321; Doug Vertrees, (541) 791-1089; email: quicktemperrc@aol.com



R/C Plus Hobbies Raceway, Salem, Oregon 97302; Ron Smith, (503) 364-9188; email: rcplus@rcplus.com; web: www.rcplus.com



R/C Speed Center, Medford, Oregon 97501; Gene & Betty Jean Skelton, 541-779-8298



Rose City Scale Racing, Milwaukie, Oregon 97222; Rick Strauss, (503) 631-2929; web: www.rc-cars.com

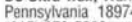


PENNSYLVANIA

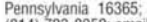
Bumps & Jumps RC Speedway, Middletown, Pennsylvania 17057; Chris McKinney, 717-728-4613; email: chrismc@bigfoot.com



Courtview Raceway, Washington, Pennsylvania 15301; Aaron Stimmell Jr., (724) 225-0398



DC Ultra Trax, Warminster, Pennsylvania 18974; David Cowan, (215) 672-5200; web: www.jrcr-hobbies.com



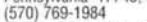
Dreamboat Hobbies, Warren, Pennsylvania 16365; Louie Dussia, (814) 723-8052; email: dreamboat77@yahoo.com



J&K Raceway, Jersey Shore, Pennsylvania 17740; Jason Corter or Kevin Casbeer, 570-398-8171; email: rcmanic@msn.com



Kranzel's R/C Raceway & Hobbies, Lemoyne, Pennsylvania 17043; David or Stuart Kranzel, (717) 737-7223; web: www.kranzelsrchoobbies.com



Little Plum R/C Hobbies, Lock Haven, Pennsylvania 17745; Larry Duck, (570) 769-1984



Marshall's R/C Raceway, Honesdale, Pennsylvania 18431; Bill or Dot Marshall, (570) 729-7458



McCullough's Offroad, Sarver, Pennsylvania 16055; Doug McCullough, (724) 352-0116; email: DMCCull323@aol.com



Newville RC Speedway, Newville, Pennsylvania 17241; Randy or Mike, 717-776-5547; email: newvillerscspeedway@yahoo.com; web: www.newvillerscspeedway.com



Pit Stop Hobbies, Mount Joy, Pennsylvania 17552, (717) 653-6222; email: pitstophobbies@pitstophobbies.net; web: www.pitstophobbies.net



Racers Edge R/C Racing, Smethport, Pennsylvania 16749; Rick Morgan or Johna Simar, (814) 887-2269; email: morg@penn.com; web: users.penn.com/~morg/track.html



RB Motorsports & Hobby, Northumberland, Pennsylvania 17857; Rick Bunting, (570) 473-8711



RC Avenue II, Bradenville, Pennsylvania 15650; Chris Demyan, 724-537-9592; email: 12ss@msn.com



RC Outfitters RCO Raceway, Hanover, Pennsylvania 17331; Chris Shaffer, (717) 633-9490; web: www.rc-hobbies.com



Riverside Raceway, Warren, Pennsylvania 16365; Jeff, (814) 723-4211



Schmidts R/C Club(Hobby), Windber, Pennsylvania 15963; Bruce Schmidt, (814) 266-4118



Staub Bros. R/C Speedway, Gettysburg, Pennsylvania 17325; Todd or Scott Staub, 717-334-8488; web: www.staubbrothers.com



The Hobby Depot, Malvern, Pennsylvania 19320; Chris McGovern, 610-725-8317



The Raceway at River Junction, Beaver, Pennsylvania 15009; Sam or John, (724) 728-5571; email: riverjct@stargate.net



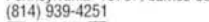
Thunder Hobbies Raceway, Indiana, Pennsylvania 15701; Brent or Lori Marshall, (724) 349-2639; email: thunderhobbies@hotmail.com



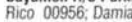
Track 84, Narran, Pennsylvania 17555; Andrew Flexer, (717) 354-6503



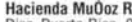
Trains & Lanes Raceway, Easton, Pennsylvania 18045; Jeff Setzer, (610) 253-8850 or (800) 447-4891; email: trainslanes@aol.com



TRP, Kingston, Pennsylvania 18704; Rob Yeager, 570-283-3066; email: RCRO899@aol.com



WillCam Raceway, Punxsutawney, Pennsylvania 15767; James Campbell, (814) 939-4251



PUERTO RICO

Bayamon R/C Park, Bayamon, Puerto Rico 00956; Damian Cruz & Javier Rivera, (787) 869-8092 & 401-2770; email: damian@bayamonrcpark.com; web: www.bayamonrcpark.com



Hacienda MuOz R/C Track, Juana Diaz, Puerto Rico 00795, (809) 837-7083



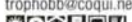
Hi-Speed C Raceways, San Juan, Puerto Rico 00926; Carlos Ortiz, (787) 283-0198; email: hisped@hotmail.com; web: www.hispedhobby.com



Mech Tech Touring Park, Caguas, Puerto Rico 00725; HUMBERTO (TITO) LIZARDI, (787) 739-1572; email: tlizardi@hotmail.com



Tropical Raceway Track, Manati, Puerto Rico 00674; Hector Pabon/George Pabon, (787) 854-8884 or (787) 884-9294; email: trophob@coqui.net



SOUTH CAROLINA

Atlantic World of Hobbies, North Charleston, South Carolina 29406; Jimmy Closson, (843) 554-3546; email: manylaps2go@worldnet.att.net



Atomic Racers, Aiken, South Carolina 29803; Bill Jackson, 706-855-0846 or 803-725-1664



Carolina R/C Speedway, Easley, South Carolina 29640; David, 864-295-1209; email: cprahirc@mindspring.com; web: www.carolinarc.com



Darlington R/C Raceway at Hobbies & More, Darlington, South Carolina 29532; Jerry Pollard, (843) 393-0355; web: www.hobbiesmore.com



Hi Voltage Raceway, Anderson, South Carolina 29625; Whitner Bowen, 1-864-225-8680; email: Jahlion247@aol.com



The Grove Racing Center, Rockhill, South Carolina 29730; Don Faris, (803) 327-4121

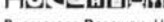


The Racing Connection, Conway, South Carolina 29527-4129; Dave Hamilton, 843-397-0124; email: dad@sccost.net; web: http://geocities.com/rc4375/racingconnection.html



SOUTH DAKOTA

Action R/C Raceway, Mitchell, South Dakota 57301; Royal(day); Roger(evenings), (605) 996-9871(days); (605) 996-2897(evenings); email: pioneer@santel.net; web: actionrcraceway.homestead.com/main.html



Boomerangs Raceway, Hartford, South Dakota 57033; Ed Smithback, (605) 528-7345



Dakota Off-Road Racers, Aberdeen, South Dakota 57401; Kevin, 605-225-5223



Grassland Racers, Black Hawk, South Dakota 57718; Ryan Logan, (605) 787-5632



SBK, Winner, South Dakota 57580; Broc Stout, (605) 842-2699



TENNESSEE

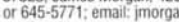
Hobby Town USA, Franklin, Tennessee 37067; Bobby Mills, (615) 771-7441; email: htu126@aol.com



MSA R/C Racing, Crossville, Tennessee 38555; D.R. Findley, (931) 456-0027



Need For Speed Raceway R/C, Chattanooga, Tennessee 37415; Ronnie Cox, (423) 876-9019



RC Speedway, Cleveland, Tennessee 37323; James Morgan, 423-472-7854 or 645-5771; email: jmorga59@bell-south.net



Robertson's R/C Raceway, Jackson, Tennessee 38301; Travis Robertson, 731-423-6984; email: RobertsonRC@aol.com



SpeedZone Raceway & R/C Hobbies, SWEETWATER, Tennessee 37874; Mike Henderson, 423-351-0055; email: speedzon@msn.com; web: www.speedzonraceway.com



W.O.W. Raceway, Beech Bluff, Tennessee 38313; Brad Jones, 731-427-1625; email: wowracer@bellsouth.net; web: go.to/wowracing



Texas

215 Speedway, Abilene, Texas 79602; Clyde Gardner, (915) 673-2351



Austex RC, Austin, Texas 78757; Michael, 512-458-2324; web: www.austexrc.com



B&B R/C Hobbies, Big Spring, Texas 79720; Walter Bumbulis, (915) 263-1790; email: b&brchobbies@apex2000.net



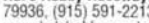
Big Mike's R/C Raceway, Longview, Texas 75604; Mike Sumrow, 903-297-7814



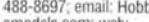
Drycreek Raceway, Greenville, Texas 75402; Micky Alphin, 903-527-5381; web: web.pulse.net/drycreek



Finishline Raceway, Hurst, Texas 76053; Damon Darnall, (972) 404-0463; email: Finishline@ev1.net; web: www.finishlinetrack.com



Hal's Hobby Raceway, El Paso, Texas 79936, (915) 591-2213; web: www.halshobbywarehouse.com



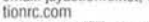
Hobby Center Race Track, Houston, Texas 77598; Issac Ben-Ezra, 281-488-8697; email: Hobbycenter@issac-smodels.com; web: www.hobbycenter.cc



Hobbytown USA, San Antonio, Texas 78209; Clark, (210) 829-8697; fax (210) 829-8707



Indy R/C World, Garland, Texas 75041; Steve Webster, (972) 271-4844; fax (972) 271-4502; web: www.indyrcworld.net



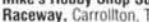
Js Action R/C, Pasadena, Texas 77503; Jack Williams, 713-946-8888; email: jayactionrc.net; web: www.jsactionrc.com



K&M Racing, New Caney, Texas 77357; Brent Mahaffy, (281) 399-9777



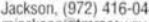
M&M Hobby Center, Bellaire, Texas 77401; Meir, 713-661-2270; email: webmaster@mmhobby.com; web: www.mmhobby.com



MBRC, Dallas, Texas 75093; Mike Battelle; email: info@mbrc-racing.com; web: www.mbrc-racing.com



Mike's Hobby Shop Superstore & Raceway, Carrollton, Texas 75006, 972-242-4930; web: www.mikes-hobbyshop.com



Intermountain R/C Raceway, Magna, Utah 84044; David Mott, 801-250-8303; email: rcmother1@aol.com; web: members.aol.com/rcmother1



Outback Raceway, Ogden, Utah 84404; Steve Brown or Beazer Martin, 801-726-3458; email: Steve@rmrcr.com or Beazer@bibbs.com; web: www.rmrcr.com or www.beazershobbies.com

Vision Hobby, Orem, Utah 84057; Ken Rice, (801) 226-6226



VERMONT

Empire Hobbies Off-Road Raceway, Saint Albans, Vermont 05478; Scott or Jen, 877-446-2243; email: empirehobbies@surflogal.net; web: www.vtwebs.com/empire-hobbies

R/C Toy Box Hobbies & Tracks LLC, East Haven, Vermont 05837; Raymond Richard, 802-467-8458; email: rctoybox@excite.com; web: myrctoybox.50megs.com



VIRGINIA

Brad's Hobbies, Staunton, Virginia 24401; Brad, (540) 885-3642; email: brads@hobbies.com

Brown Brothers Hobbies, Dumfries, Virginia 22026; Joe or Bob Brown, 703-221-5746; email: joe@bbhobbies.com; web: www.bbhbobbies.com

DRCW Raceway, Virginia Beach, Virginia 23454; Les Modlin, 757-340-6681; web: www.debbiesrcworld.com

Griffin Hobby & Raceway, Bristol, Virginia 24201; Danny Griffin & Greg Johnson, (540) 466-3652; email: grjohn@yahoo.com

Hampton RC Speedway, Hampton, Virginia 23663; Steve or Bill, (757) 723-1884

Hampton Roads R/C Drag Club, Virginia Beach, Virginia 23452; Garry Nelson, 757-399-8645; email: Garry@gsdragracing.com; web: www.HRRCCD.com

KC's Radio Control & Repair, Lynchburg, Virginia 24503; Curtis or Kim Wright, (804) 384-8596

Linville Hobbies Raceway, Linville, Virginia 22834; Jerry Shenk, (540)833-2222; email: linvillehobbies@juno.com; web: www.linvillehobbies.com

Olde Towne Hobby Shoppe, Manassas, Virginia 20110; Jeff Gough, (703) 369-1197; web: www.olde-towne-hobby.com

Roanoke R/C Club, Salem, Virginia 24153; Chad Trent, 540-314-6257; email: roanokerc@aol.com; web: roanokerc.cjb.net

Shamroc Raceway, Winchester, Virginia 22601; Denise Fletcher, 540-869-4162

Stream Hobby Shop, Newport News, Virginia 23605; Rusty Kennedy or Jerry Moore, (757) 591-0720

STREAM HOBBY SHOP, NEWPORT NEWS, Virginia 23605; RUSTY KENNEDY, 757-591-0720; email: STREAMRC@aol.com; web: STREAMHOBBYSHOP.COM

The Tiltyard, Dayton, Virginia 22821; Homer, 540-828-3476; email: homer@tiltyard.com; web: www.tilt-yard.com

Thunder Road RC Speedway, Gordonsville, Virginia 22947; Robert Binger, (804) 296-6549; email: rwb3y@virginia.edu; web: www.thunderroadrc.com

WASHINGTON
A-Main Raceway, Vancouver, Washington 98685; Monty Coleman, (360) 571-8404; web: www.amainraceway.com

Burien Toyota R/C, Seattle, Washington 98148; Ray Meek, (800) 654-6456

Cedarvale Raceway, Mount Vernon, Washington 98273; Craig, 360-755-9464

Fantasy World Raceway, Tacoma, Washington 98408; Dave Kleinman, (253) 473-6223; web: www.fantasy-worldhobbies.com

Four Season R/C Racing, Olympia, Washington 98506; Gary and Sharon Brown, (360) 491-2430

Hank Perry Raceway, Spokane, Washington 99023; Hal Hudson, 509-879-3503; email: halshudson@msn.com

HobbyTown USA, Tacoma, Washington 98408; HobbyTown USA Shop, (253) 474-7787

HobbyTown USA, Lynnwood, Washington 98037; Rich or Jamie, 425-774-0819; email: RHOBBY-TOWN@aol.com

Paradise Raceway and Hobbies, Spokane, Washington 99207; Mark, 509-483-1843; email: paradiserc@hot-mail.com; web: www.websellers.com/paradise

Race City, Auburn, Washington 98002; Bruce, (253) 939-2515; email: auburn@pacifier.com

Rain City RC Raceway, Mukilteo, Washington 98021; Pete or Debbie Cartwright, 425-438-2454; email: info@raincityraceway.com; web: www.raincityraceway.com

Redmond Hobbies Raceway, Redmond, Washington 98052; Stan Ng, (425) 885-3639; email: info@redmondhobbies.com; web: redmondhobbies.com

Schmidt's Auto Parts, Marysville, Washington 98271; Jon Failla, (360) 653-8838; web: www.schmidtsrccracingway.com

Spokane Indoor Raceway, Spokane, Washington 99212; Brian Batch, 509-487-2122

Tacoma R/C Raceway, Tacoma, Washington 98406; Scott Brown, (253) 565-1935; web: www.tacomarcraceway.com

West Coast Hobby & Raceway, Richland, Washington 99352; Darren Shank, (509) 375-4995

WEST VIRGINIA
Burr Fab R.C. Raceway, West Union, West Virginia 26456; Mark Travis, 304-873-2487; email: burrhouse1@cs.com

Fulton's R/C Raceway, Wheeling, West Virginia 26003; James Fulton, (304) 233-5355

Mountwood Raceway, Waverly, West Virginia 26184; Ryan Taylor, (304) 295-3217; email: ryan@ovrccc.com; web: www.ovrccc.com

Quiet Dell Raceway, Fairmont, West Virginia 26554; Darris, (304) 366-1441; email: Tateracing@aol.com

WISCONSIN
ABC R/C Inc & Raceway, Waukesha, Wisconsin 53186; Dick Mathieson, 262-542-1245; email: Help@abcrhobby.com; web: www.abcrhobby.com

Best's Hobbies, Appleton, Wisconsin 54914; Peggy, 920-734-5244; email: appletonrc@hotmail.com; web: www.besthobbies.com

Gary's Hobby Center, Racine, Wisconsin 53403; Bill Phalen, 262-554-8884

Hobbytown USA - Revolution Raceway, Sheboygan, Wisconsin 53081; Kenny, (920) 452-0801; web: www.hobbytownsheb.com

KDM Raceway, Abbotsford, Wisconsin 54405; Kevin Michlig, 715-223-4414; email: kdmhobby@pcpro.net; web: kdmhobby.homestead.com/kdmhobby.html

MARCCA Raceways, Monticello, Wisconsin 53570, 608-243-1778; email: asylumrc@yahoo.com; web: www.marcca.com

Mid-West Tri-Clone/Tri-Clone Off-Road, West Bend, Wisconsin 53095; Dave Hilpert, 262-334-0429 or 262-626-2238; email: mwto@hnet.com; web: www.triclone.com

Pro-Star Racing, Green Bay, Wisconsin 54301; Chuck or Terry, (920) 494-1233 or (920) 469-5566

S&N's Trackside Hobbies and Raceway, Milwaukee, Wisconsin 53209; Scott Ernst, (414) 351-1910; email: sernst@trackside.com; web: www.trackside.com

The Shorthalf Raceway, Eau Claire, Wisconsin 54701; Scott Schoettie, 715-838-8350; email: Scottschoettie@mcleodusa.net

WYOMING
Xtreme Hobbies Raceway, Gillette, Wyoming 82718; Krieb Balls, 307-682-6077; email: xtreme@vcn.com

ARGENTINA
Circito R/C Lobos, Lobos, Buenos Aires 7240; Rupert Bruce, 54-02227-422905; email: rclobos@yahoo.com; web: www.rclobos.8m.com

Circuit M.R. Models, Buenos Aires 1428; Maximiliano Roballos, 54 11 4557 1000, fax 4780 1677; email: info@kyosho-argentina.com.ar; web: www.kyosho-argentina.com.ar

Club A. Velez Sarsfield, Buenos Aires; Jorge Herrero, 54-01-658-5851

AUSTRIA
A.C.T. Model Car Racing Club, Wanniassa, ACT; Gary Davey, 61-6-2871411

A.C.T. Remote Control Car Club, Kambah, ACT; Rob Jorgensen, 61-2-6231-9925; email: bjorgo@isr.gov.au; web: users.bigpond.net.au/grj/actrccc.html

Aubry R/C Car Club, Aubry, New South Wales 2640; Ron Langman, 060-247-128

Brisbane Dirt Racing, Brisbane, Queensland 4053; Jeff Chandler, 07 3355 7476, 041 878 3201; email: smeg666@bigpond.com; web: www.gofast.to/race

Canberra Off-Road Model Car Club, Narrabundah, ACT 2604; Graham Brown, 61-6-241-3070

Carine R/C Model Car Club, Inc., Greenwood, Western Australia; David Werner, 61-418922966

Castle Hill Radio Control Off Road Car Club, Castle Hill, New South Wales 2754; Peter Ellis, 0412 257 353; email: chrccrcc@nextcentury.com.au; web: www.2nextcentury.com.au/chrccrcc

Central Coast ORRCC, Bateau Bay, New South Wales 2261; Peter J. Knight, 61-43-693-698

Illawarra RCECC, Albion Park Rail, New South Wales 2527; Mel or Andrew, 042-714-683

Lakeside R/C Racing Car Club, Lansvale, New South Wales 2166; R. Bartolozzi, 62-2-907-9800

Melton Electric Circuit Car Association, Melton, VIC 3337; Arthur Joslin, 61-3-9747-8805

Monaro Radio Control Car Club, Queanbeyan, New South Wales 2902; Graham Brown, 02 6241 3070; email: gbrown@webone.com.au; web: www.webone.com.au/~gbrown/mrccc/index.html

NSW Indoor R/C Raceway, Hurstville, Sydney 2220; Anthony Lee or Walter Ly, 02-9585-8810

Penfield Park, Adelaide, South Australia 5108; Trevor UNew South Walesorth, (618) 8289-5010

R.C. Speedway, Newcastle, New South Wales 2300; Andrew Dillon-Smith, 02-49265966

TFTF - Templestowe Flat Track Racers, Templestowe, Victoria 3106; Nigel George, see website; email: tftf@imagefile.net; web: drive.to/tftf

The Bayside Raceway, Brisbane, Queensland 4178; Nigel Bell, 07 3893 1864; email: mwr1@dingobue.net.au

Victorian Radio Control Drag Racing Association, Melbourne, VIC 3940; John de Tracy, 03 59820459; email: bjrn01@hotmail.com; web: www.ozemail.com.au/~john59/index.html

Wee Waa's Offroad RC, Burren Junction, New South Wales 2386; Shane, 61-02-6796-1339

Wodonga R/C Car Club, Wodonga, VIC 3690; Ron Langman, 61-60-247-128

AUSTRIA
RM-C-Wien, Vienna A-1220; Herbert Holze/Martin Hrzak, +43-664-4730376

BARBADOS, WEST INDIES
R.O.A.R. (Radio Operated Auto Racing), St. Michael; Marva Clarke, (246) 427-3907

BELGIUM
ATR-Alka-Tele-Racing, Limburg; Alken, 0032-11-25-49-03

MBV-Kamphenhout, Kamphenhout B1910; Frank Mostrey, 0-16-65-75-18

Model Racing Club Oudenaarde (MRCO), 9700 Oudenaarde; Nicky Delmote, and fax: 32 55 30 36 25; email: mrcracing@hotmail.com; web: mrcracing.tripod.com

MRCZ, De Burg; Montie, 75-71-63

R.C.R., Retie 2470; A. Eelen, 32-14-379685

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Electric Car Club R/C Santos, Santos, SP 11065-001; Estevam or Arnaldo, 55-013-232-2536

Hobby Center, Brasilia, DF 70.273, 061-242-0488

Hobby Planet Racing Club, Campinas, SP 13091901; Daniel, Helio, Luciano, 019 258 2768

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Off Roaders, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931

KEY TO SYMBOLS
Indoor
Outdoor
Off-road
On-road
Oval
Dirt oval
Carpet

Concrete
Asphalt
Minis & Micros
On-site hobby shop
AC power
Auto lap counting
Food available

Concrete
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CANADA

ATN, Saint-Jean-Baptiste-de-Nicolet, Quebec J3T 1E5; Louis Durand, (819) 293-6097



Battlefield R/C Raceway, Cobourg, Ontario K9A 2G3; Tony Hopcraft, (905)373-8373; email: tonyhopcraft@yahoo.com; web: www.battlefield-rc.com7.org



C.A.R.C.A.R., Calgary; Simon Smith, (403) 280-9040; web: www.drive-to/carcar



Cactus Speedway, Ruthven, Ontario N0P 2G0; Terry Torelli, (519) 735-7122; email: osthunder@sympatico.ca; web: www.mnsl.net/~glenn/sparc.htm



Cam R/C, Coquitlam, British Columbia V3E 1K9; Roger Brown, 604-945-3888



Circuit J.C., St. Polycarpe, Quebec J0P 1X0; Jean Castellon, 450-265-3675



Circuit Teleguide ST Roch, ST Roch De L' Achigan, Quebec J0K 3H0; Gerald Beauchamp, 450-588-4254; email: gedoroam@colba.net; web: www.grcsr.com



Copetown Raceway, Copetown, Ontario; Adam Filipowicz; email: adamfilip@home.com; web: copetown-raceway.8k.com



Dynamic Hobbies, Nepean, Ontario K2E7S4; Fred Zufelt, (613) 225-9634; web: www.members.home.net/rcot-tawa



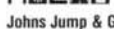
HobbyHobby P.L.R.C., Mississauga, Ontario L5M 1K8; Tom Bakonyi, 905-858-7978; email: info@hobbyhobby.com; web: www.hobbyhobby.com



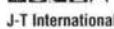
Honda House Motor Speedway, Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530



IROCC, Victoria, British Columbia V9B 5W9; Daryl Jones, (250) 478-8013; email: dbjones@shaw.ca



Johns Jump & Grind R/C Track, Waterville, Nova Scotia B0P 1V0; John Egan, 902-538-8920; email: john.egan@ns.sympatico.ca; web: www.jagrc.com



J-T International Raceway, Nananee, Ontario K7R 8A1; N. O'Neill, (613) 354-0099



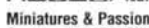
Kays Hobbies R/C Raceway, Moorefield, Ontario N0G 2K0; Doug Kay, 519-638-9990; email: dougk@golden.net; web: www.kayshobbies.place.cc



Leading Edge R/C Speedway, Kingston, Ontario K7M 3Y5; Mike and Tony Daicra, 613-389-4878



Mid-Canada R/C Auto Racing, Winnipeg, Manitoba R2J 4E6; Jason McBride, 204-231-3324; email: hjmcb@escape.ca; web: www.geocities.com/midcanadarcautoracing



Miniatures & Passions, Ste. Therese, Quebec J7E 2B4; Gilles Lachance, (450) 979-7989



Mini-Z Hobby Shop, Markham, Ontario L3R 0W4; Brian Pong, (905)940-0898; email: info@minizhobbyshop.com; web: www.minizhobbyshop.com



Prince George Radio Controlled Car Club, Prince George, British Columbia V2M 5R9; Doug Waller, 250-561-0035



R/C Champ Raceway, Scarborough, Ontario M1H 3A4; Ben, Matthew or Louie, (416) 289-8717; web: www.rcchamp.com



R/C Fanatic, Charlesbourg, Quebec G1G 3Y4; Marc Page (Club President), 418-265-2678; email: info@rcfanatic.com; web: www.rcfanatic.com



Recreation R/C Raceway, Prince George, British Columbia; Doug Waller, (604) 561-0035



Steeltown Speedway, Binbrook, Ontario L0R 1C0; Trevor Harrison, 905-692-3407 (ask for Trevor); email: the_prodigy@znetonebox.com; web: www.geocities.com/s_speedway



Sudbury Ontario Auto Racing, Val Caron, Ontario P3E 1E6; Brad Peacock, 705-897-1435 (Brad); email: bradbrendakyle@sympatico.ca



The All New R.C. World, Hamilton, Ontario L0R 1W0; Dave, Larry or Brian, (905) 765-2301 or (905) 333-3297



Vancouver R/C Road Racers, Coquitlam, British Columbia V3E 1K9; Roger Brown, (604) 945-3888



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Klub 144 Raceway, Lyngby 2800; Henrik Carstens, 45-42-88-3691



Rainbow Raceway, Copenhagen 2600; P. Christiansen, 45-52-848-504



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La Barranquita R/C International Speedway, Santiago, (809) 582-2303



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Hampshire Racing Center, Basingstoke, Hampshire; Tony Eudola, 44-1276-61402



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FRANCE

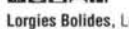
Auto Electron, Limoges 87000; M. Boudouil, 55 062763



Auto Model Club de l'ouest, Lojehet 29470; Peuziat Michel, 98071764



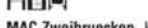
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CSRM, Lyon 69009; Pierre-Yves Montfroy, 06 78880852



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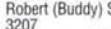
MC Koln, Worringen 50769; Ralf Habel, 02733-477493



Mini Car Club Dortmund, Dortmund 4600; Roland Schwan, 0231/213609



Oberhausen-Alfstadt, Oberhausen 46099; Josef Holl, 0208-403676

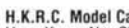


Panik Raceway, Troisdorf 53844; Guido Kraft, 0224-400259



GUAM

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Kingsville Buggy Arena, Shatin; Pak Yeung, (852) 607-0828

INDONESIA

1st Circuit, Surabaya, 62-31-5681965



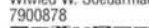
Ancol, Jakarta, ACT 14350; Andre Supryanata, 62 21 6506040; email: andre@cbn.net.id; web: www.auvis.com/ja



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Pondok Cabe Circuit, JL. Kunir No. 83, Jakarta; Ali Agus Salim, 7403568-9; fax 7491533



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Yokota R/C Racers, Tokyo APO AP 96326; Donnie Leornas, 81-3-11-757-2012 or 755-2272



Zama Off-Road Raceway, APO AP 96338; Ken Campbell, 81-3117-63-8478



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Inferno DX 4WD Track, Ahadi 61002; Yousef Acqatari



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Wild Willy RCC, Beirut, 00961-4-403751



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Jump Square Arena, Selanhor; Thomson Chong, (603) 656-2513



Niko Sales & Service Centre, Johor Bahru; Niko Cheng, (607) 234-3615; email: niko3@pd.jaring.my; web: www.niko.com.my



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Baja Jr of GDL, Tlaquepaque, Jalisco 44000; Guillermo Asencio, 01-3825-3169 / 3671-5432; email: memosascio@prodigy.net.mx



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Club Kyosho de Automodelismo Departamento, Mexico, D.F. 04330; Jorge Perez Holder, 525-5689-4150; fax 525-5544-7133; email: spedshop@data.net.mx



Desestreza Racing Club, Aguascalientes, Aguascalientes; Luis Lopez, 44 98 961296; email: luis_lopez@jabil.com



Hobby Centro, Guadalajara, JAL 45550; Alejandro Ortiz Del Toro, 36-21-46-28



Hobby Model's Raceway, Morelia, Michoacan 58260, 431-5-01-22



Hobby's Formula, DF 01120, 905-502-3620



Jaguar R/C Club, Puebla 72150; Denise or Chiro, 22-31-00-91, 22-33-00-94



La Hielera, Queretaro, QRO 76160; Jorge Morelos Rabell, 42-12-15-25



Micromotori Club, Jalisco, Jalisco 44640; Francisco Ortiz Sevilla, 52-36418672; email: fstmynr@hotmail.com



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Western District R/C Off-Road Car Club, Auckland, Chris, 09-838-5201



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Dalen Raceway, Molde; Johnny Reitan, 94 64 52 95


Hadeland Raceway, Gran; Dag Bakke-Nilssen, 61330405


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PHILIPPINES

Boyal R/C Hobby Shop, Rizal; Jose Chua, 721-2555


Philippine F1/Touring Club, Quezon City, Manila 1156; Raymond Aguilar/Ron Villalor, 896-64-15-23-30-08


Philippine R/C Association, Manila, Manila; Ronald/Manny Villalor, 23-30-08


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Frantic Raceway, Welkon; Wayne Roodt, 27-57-35-72849


Gordons Bay R/C Club (GBRC), Gordons Bay, Cape Province; Andre Hollander, 024-512865


Grand Prix Electric Car Club, Bokisburg, Gauteng; Gary Gibson, 27-11-826-1720


Helderberg Radio Control Car Club, Somerset West, Cape Province; Andre Hollander, 024-51-2865


Lowveld Radio Control Thunderdome, Nelspruit, Eastern Transvaal; Martin Van Der Merwe, 01311-534-6415


MERC Racing, Rustenburg, RSA 0300; Gerrie Pretorius, 014-5974569


Norkem Raceway Club, Gauteng; Dan de Agrella, 2711-972-7011; email: craig@mvweb.co.za


Parow Radio Car Club, Parow, Cape Province; Stirling Spengler, 021-945-4957


Parow Radio Control Car Club, Parow, Cape Province 7530; Craig, +27 21 919-5859; email: craig@kingsley.co.za; web: www.speedmodels.za.org


Phoenix Raceway, Stilfontein, Transvaal; Lionel Edwards, 018-4842863


Pick 'n' Pay Model Car Club, Klerksdorp 2570; H. Grobbs, (27) 18 46245421


Pietersburg Model Racing, Pietersburg, Northern Transvaal; Peter Van Vuuren, 0152- 293-0700


Pretoria Model Racers, Pretoria, Gauteng; Deon Cerf, 27-083-630-2045; web: www.pretoriarmr.co.za


Pretoria Off Road R/C Club, Pretoria, Gauteng; Gert Swart, 012- 377-3238


R.A.C.E. Off Road, Maraisburg, Gauteng; Derrick Plank, 682-2173


R.C. Superbowl, Elsburg, Johannesburg; Karl Fawcett, 27119076145


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Outlaw-Ultima II, Madrid 28016; Juan Vacas, 915197298


SWEDEN

Amalie Racetrack, Sollenbrunn 5-46632; Tage Johansson


PROCAR Speedway, Veddigge 430 20; Lars Nordin, 46-0-340-38784; fax 46-0-340-38694; email: info@procar.se; web: www.procar.se


Sollenbrunn Miniracing Club, Alingsaas; Tage Johansson, 46-322-40944; email: tage.j@swipnet.se


Staffanstorps Highway 1:8 Track, Staffanstorps 245 45; B'rje Petersson, 46 0 46-256832


torvinge raceway, rappestad, SP 59047 vikingstad; mats johansson, 013-808445; email: mats.j@swipnet.se; web: drive.to/miraci


Touring 1:10 Raceway (& Mini-Z Raceway), Ronneby, Blekinge 372 35; Mikael Nilsson, +046 457 160 07; email: mickel2@telia.com; web: drive.to/rck


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ERMC Raceway, Grand-Saconnex 1218; M. Maurer, 19-41-22-798-9765


JMRCV-Terraindu Levant, Geneva 1290, fax 19 41 22 7790805


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Mustang Hobbies Raceway, Istanbul; Murat Esibat r, 902163863171 (1hat); email: dosdemir@ixir.com; web: www.mustanghobbies.com.tr


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R/C Mariche, Caracas DF 1070-A; Bruno Morganti, 58-02-241-3969 or 241-4993


Santa Paula R/C Club, Caracas; Abecasis or Franco Agrusa, 02-2423954 or 02-4510314


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| ☐ Outdoor | ☐ Asphalt |
| ☐ Off-road | ☐ Minis & Micros |
| ☐ On-road | ☐ On-site hobby shop |
| ☐ Oval | ☐ AC power |
| ☐ Dirt | ☐ Automatic lap-counting |
| ☐ Carpet | ☐ Food available |

KEY TO SYMBOLS

- | | | | |
|---|-----------|---|--------------------|
|  | Indoor |  | Concrete |
|  | Outdoor |  | Asphalt |
|  | Off-road |  | Minis & Micros |
|  | On-road |  | On-site hobby shop |
|  | Oval |  | AC power |
|  | Dirt oval |  | Auto lap counting |
|  | Carpet |  | Food available |

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RANDOM RADIO CONTROL RAMBLINGS

BY PETER VIEIRA

THE LIFE

Ever dream of being a factory pro? Of course you have. It's just a whirlwind of free stuff, exotic travel, fan adoration and trophy girls—right? Uh ... kind of. Take a look behind the scenes at the Trinity Snowbird Nats (full coverage coming soon) for a taste of life as an RC pro.



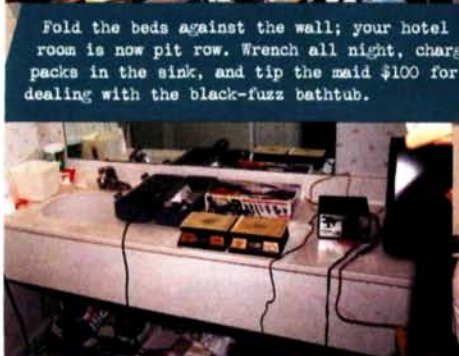
Pizza! It's great for lunch. And dinner. And breakfast. And a snack. It's not just a food, this stuff is a food group.



Fold the beds against the wall; your hotel room is now pit row. Wrench all night, charge packs in the sink, and tip the maid \$100 for dealing with the black-fuzz bathtub.



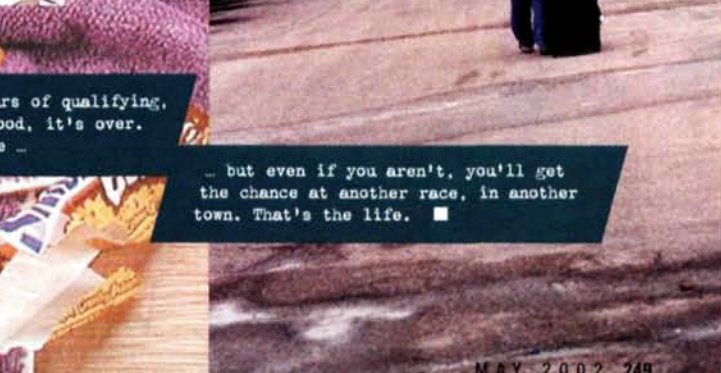
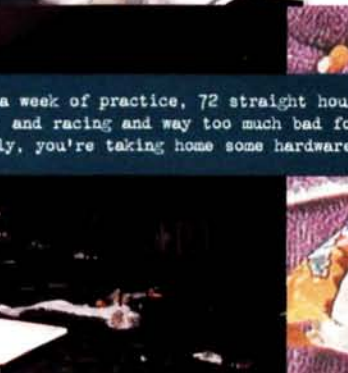
No vacancy? Trailer your own mobile garage to the track. "If the van's a-rockin', don't come knockin' because the compressor is running, and I won't hear you".



What do arch rivals do when they aren't battling on the track? They hang out ... and maybe shoot a little Nerf Hoop.



After a week of practice, 72 straight hours of qualifying, tuning, and racing and way too much bad food, it's over. Hopefully, you're taking home some hardware ...



... but even if you aren't, you'll get the chance at another race, in another town. That's the life. ■